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## LOUDSPEAKERS

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INTRODUCTION

The data are presented -whenever possible- according to a "format", in which the following items may be stated:

- Title
- APPLICATION
- TECHNICAL DATA
- DIMENSIONS IN MM
- AVAILABLE VERSIONS
- FREQUENCY RESPONSE CURVES

Besides APPLICATION other particulars may be stated, relating to frame, cone, surround (suspension or rim), gaskets, magnetic compensation and recommended enclosure.

TECHNICAL DATA include:

	version	
	.. .. . . .	
Rated impedance		$\Omega$
Voice coil resistance		$\Omega$
Rated frequency range		Hz
Resonance frequency		Hz
Cross-over frequency ( . . dB/octave slope)		Hz
Distortion		%
Power handling capacity, measured without filter, loudspeaker unmounted		W
Max. power on loudspeaker		W
Operating power (sound level . . . dB, . . . m)		W
Sweep voltage ( . . . to . . . . . Hz)		V
Filter		
Characteristic sensitivity		dB
Energy in air gap		mJ
Flux density		T
Force factor (B x l) at 1 A		Wb/m
Piston diameter		m
Piston area		m <sup>2</sup>
Total moving mass		kg
Compliance, loudspeaker unmounted		m/N
Equivalent box-volume		l
Quality factor, loudspeaker unmounted or mounted in recommended volume,		
mechanical		
electrical		
total		
Air-gap height		mm
Air-gap length		mm
Voice-coil height		mm
Rated core diameter		mm
Rated coil diameter		mm
Magnet material		
diameter		mm
mass		kg
Mass of loudspeaker		kg
Magnetic stray field according to . . . . .		mT
Connection		

DIMENSIONS, in mm (unless otherwise indicated), are shown in a drawing giving the front or rear view of the speaker and a side view, the upper half of which is usually drawn as a cross section.

AVAILABLE VERSIONS include the type number (AD . . . .), and the catalogue number which is to be used for ordering. Where applicable the standard packing quantity is also mentioned.

FREQUENCY RESPONSE CURVES of the loudspeakers, mounted on an IEC baffle show the sound pressure as a function of frequency. These frequency response curves are reproduced in such a way that they can be directly compared with Bruel & Kjaer recording charts QP1124.

CHOICE OF TYPE

It is essential to choose the correct loudspeaker for adequate acoustic results from electro-acoustic equipment.

The following factors should be considered when choosing a loudspeaker:

- shape, size and attachment with reference to the available space;
- quality and sensitivity, a compromise between fidelity of reproduction and price;
- the frequency response characteristic in relation to the kind of application;
- impedance and power handling capacity, which should be adapted to the output stage of the equipment.
- appearance and finish.

To assist customers in making their choice, our loudspeakers have been divided into the following groups:

- tweeter loudspeakers
- squawker loudspeakers
- woofer loudspeakers
- full range loudspeakers

A further selection may be made on the basis of operating power or characteristic sensitivity. High power speakers include top quality woofers, squawkers and tweeters for use in special combinations with appropriate filters and enclosures. Their excellent sound reproduction conforms in every respect to the high-fidelity standards IEC 268 and DIN 45 500. The system power handling capacity is from 10 to 250 W, the latter for theatre and outdoor applications. Full range high power loudspeakers are also available. These speakers also conform to IEC 268 and DIN 45 500 but have been designed to meet somewhat less stringent requirements. They are specially for juke boxes, musical instruments, monitoring and public address systems.

Medium power loudspeakers can be subdivided according to the application into round and oval versions, usually for radio, audio and television. For the latter application types with screened and/or compensated magnet systems are available.

Low power types are mainly used in small radios, intercoms and portable television.

SELECTION TABLES

The loudspeakers are divided into groups as shown in the survey below. *Conversion of catalogue number to type number is given in the list following this survey.* All loudspeakers are equipped with ceramic magnets unless otherwise indicated in the column "core diameter".

TWEETER LOUDSPEAKERS

basic part of type number	impedance $\Omega$	resonance frequency Hz	core diameter mm	power handling capacity W	max. dimensions			page
					flange		mounting depth mm	
					inch	mm		
AD00972/T4	4	2100	18 RE	10	3/4	35 $\phi$	11	25
AD01700/T8	8	2000	10	20	2	54 $\phi$	13	28
AD11700/T8						64 $\square$		
AD11400/T.						4/8		
AD11410/T.								
AD11430/T.	4/8	1000	25	3,5	1	82 $\square$	40,1	81
AD11600/T.	4/8	1300	25	6	1	96 $\square$	33,6	84
AD11610/T.	4/8	1300	25	6	1	96 $\square$	33,6	87
AD11800/T.	4/8	1700	25	4	1	75 $\square$	25	90
AD11810/T.	4/8	1600	25	4	1	75 $\square$	25	93
AD11830/T.	4/8	1000	25	4	1	75 $\square$	37,4	96
AD20303/T.	4/8/15	2500	14,5	4	2	55 $\phi$	21	123
AD22303/T.						66 $\square$	23	123
AD20311/T.						4/8/15	2500	14,5
AD22311/T.	66 $\square$	32	127					
AD20851/T.	4/8/15	2400	14,5	4	2	55 $\phi$	24	135
AD22851/T.						66 $\square$	26	135
AD21600/RT8						8	—	—

RE = rare earth;  $\phi$  = diameter;  $\square$  = square.

SQUAWKER LOUDSPEAKERS

basic part of type number	impedance $\Omega$	resonance frequency Hz	core diameter mm	power handling capacity W	max. dimensions			page
					flange		mounting depth mm	
					inch	mm		
- AD02110/Sq.	4/8	340/360	50	30	2	134 $\square$	103	41
AD02150/Sq.	4/8	340/360	50	30	2	134 $\square$	98	44
AD02170/Sq8	8	640	50	25	3	134 $\square$	88	47
AD33303/Sq.	4/8/15	950	14,5	5	3	97 $\square$	32	154
AD33851/Sq.	4/8	950	14,5	5	3	97 $\square$	34	157
AD50600/Sq.	4/8	260	25	20	5	129	107	277
AD50800/Sq.	4/8	280	18	15	5	129	107	289

WOOFER LOUDSPEAKERS

AD10202/W8	8	26	50	80	10	258	116	65
AD10252/W6	6	27	50	100	10	258	118,5	68
AD10602/W8	8	31	25	40	10	258	105	71
AD10672/W8	8	27	35	60	10	258	109,5	74
AD12202/W8	8	24	50	80	12	311	118,6	105
AD12252/W8	8	27	50	100	12	311	120	113
AD12672/W8	8	26	35	60	12	311	114,5	119
AD36510/W4	4	68	18	15	3 x 6	80 x 160	62,4	181
AD36900/P.	4/8/15	95	18	8	3 x 6	80 x 160	59	196
AD36900/W.	4/8	75	18	8	3 x 6	80 x 160	59	199
AD38903/P.	8/15	95	18	8	3 x 8	81,6 x 204,6	61	206
AD40501/W.	4/8	72	25	20	4	102 $\phi$	59,5	212
AD44900/P.	4/8/15	110	18	8	4	102 $\square$	56	237
AD44900/W4	4	65	18	8	4	102 $\square$	56	240
AD44901/W4								
AD51502/W4M	4	70	25	20	5/8	130 $\square$	68,5	295
AD51610/W.	4/8	62	25	30	5/8	130 $\square$	57,7	298
AD51800/W4	4	85	18	15	5/8	130 $\square$	56,1	301
AD70400/W8	8	74	18	30	7	165,2 $\phi$	58	311
AD70604/W4	4	48	25	40	7	165,2 $\phi$	60	314
AD70804/W.	4/8	86	18	20	7	166 $\phi$	66,5	329
AD70805/W8	8	74	18	25	7	165,2 $\phi$	66,5	333
- AD80110/W.	6/8	40	35	60	8	204 $\phi$	94	345
AD80400/W8	8	62	18	40	8	205 $\phi$	75,6	349
AD80405/W8	8	50	25	35	8	204 $\phi$	81	352
AD80602/W.	4/8	42	25	50	8	204 $\phi$	85,6	355
AD80605/W6	6	50	25	40	8	204 $\phi$	79	358
AD80606/W.	4/6/8	36/40/38	25	50	8	204 $\phi$	84	361
AD80609/W6	6	43	25	50	8	204 $\phi$	88,5	364
AD80612/W8	8	47	25	50	8	204 $\phi$	88,5	367
AD80652/W.	4/8	39	25	50	8	204 $\phi$	87,6	370
AD80680/W8	8	35	35	55	8	204 $\phi$	91	373
AD80681/W.	4/8	48/47	35	50	8	200	90	376
AD80800/W4	4	52	18	25	8	194 $\phi$	77,6	384

$\phi$  = diameter;  $\square$  = square.

FULL RANGE LOUDSPEAKERS

basic part of type number	impedance $\Omega$	resonance frequency Hz	core diameter mm	power handling capacity W	max. dimensions			page
					flange		mounting depth mm	
					inch	mm		
AD01750/Y.	8	430	10	0,3	1½	38 $\phi$	7,3	31
AD01980/Y.	8/15/25	600	14,5 RE	0,3	1,33	34 $\phi$	5	34
AD01985/Y.	8/15/25	600	14,5 RE	0,3	1,5	36 $\phi$	5	37
AD2071/Z.	4/8/15/25/150	360	10	1	2,5	64 $\phi$	19,7	50
AD3071/Y.	4/8/15/25/150	250	10	2	3	81 $\phi$	23	53
AD3371/Y.						81 $\square$		
AD4072/X.	4/8/15/25	170	10	3	4	105 $\phi$	30,5	57
AD4472/X.						105 $\phi$		
AD4074/X.	4/8/15/25	170	10	2,5	4	105 $\phi$	44	61
AD4474/X.						105 $\phi$		
AD12202/M.	4/8	45	35	100	12	312,4 $\phi$	135	99
AD12202/P8	8	45	35	100	12	312,4 $\phi$	135	102
AD12252/HP.	4/8	55	50	150	12	312,4 $\phi$	152	109
AD12672/MP.	4/8	45	35	60	12	311	137,8	115
AD20750/Y8	8	350	10	0,3	2	50	15,6	131
AD24370/X15	15	165	12	4	2 x 3,5	56 x 96	47	142
AD26313/X25	25	155	14,5	5	2 x 6	57 x 160	48	145
AD26921/X.	4/8/15/25	155	14,5	5	2 x 6	57 x 160	50	148
AD26951/X25	25	155	14,5	5	2 x 6	57 x 160	45,5	151
AD33910/X4	4	85	18	12	3	87,2 $\square$	43,3	160
AD35720/X.	4/8/15/25	160	10	3	3 x 5	75 x 130	35	163
AD35740/X.						75 x 130	47	
AD35721/X.	4/8/15/25	160	10	2,5	3 x 5	75 x 130	35	166
AD35741/X1						75 x 130	47	
AD35722/X.	4/8/15/25	160	10	3	3 x 5	75 x 130	35	169
AD35741/X.						75 x 130	47	
AD35725/X.	4/8/15/25	160	10	5	3 x 5	75 x 130	35	172
AD35746/X.						75 x 130	47	
AD35726/X.	4/8/15/25	160	10	5	3 x 5	75 x 130	35	175
AD35747/X.						75 x 130	47	
AD35727/X.	4/8/15/25	160	10	5	3 x 5	75 x 130	35	178
AD35748/X.						75 x 130	47	
AD36720/X.	4/8/15/25	130	10	3	3 x 6	80 x 160	45	184
AD36740/X.						80 x 160	55	
AD36722/X.	4/8/15/25	130	10	3	3 x 6	80 x 160	45	187
AD36742/X.						80 x 160	55	
AD36725/X.	4/8/15/25	130	10	5	3 x 6	80 x 160	45	190
AD36746/X.						80 x 160	55	
AD36727/X.	4/8/15/25	130	10	5	3 x 6	80 x 160	45	193
AD36748/X.						80 x 160	55	
AD36901/X.	8/15	95	18	8	3 x 6	80 x 160	57,6	203
AD38903/X.	418	95	18	8	3 x 8	80 x 204	61	210

RE = rare earth;  $\phi$  = diameter.

FULL RANGE LOUDSPEAKERS

basic part of type number	impedance $\Omega$	resonance frequency Hz	core diameter mm	power handling capacity W	max. dimensions			page
					flange		mounting depth mm	
					inch	mm		
AD40725/X.	4/8/15/25	170	10	5	4	105 $\phi$	30,5	215
AD40745/X.						44		
AD40880/X.	4/8	150	14,5	6	4	102 $\phi$	40,5	218
AD44322/X.	4/8/15	170	14,5	4	4	102 $\square$	39,1	221
AD44400/M4	4	110	18	15	4	102 $\square$	52,2	224
AD44401/M4						102 $\square$		
AD44725/X.	4/8/15/25	170	10	5	4	105 $\phi$	30,5	227
AD44745/X.						44		
AD44830/X.	4/8	140	18	8	4	102 $\square$	42,7	231
AD44880/X.	4/8	150	14,5	6	4	102 $\square$	40,5	234
AD44900/X.	4/8/15/25	90	18	8	4	102 $\square$	56	243
AD44901/X.						102 $\square$		
AD46720/X.	4/8/15/25	130	10	4	4 x 6	102 x 154	44	246
AD46740/X.						56		
AD46721/X.	4/8/15/25	130	10	5	4 x 6	102 x 154	44	249
AD46741/X.						56		
AD46722/X.	4/8/15/25	130	10	5	4 x 6	102 x 154	44	252
AD46742/X.						56		
AD46725/X.	4/8/15/25	130	10	5	4 x 6	102 x 154	44	255
AD46746/X.						56		
AD46726/X.	4/8/15/25	130	10	5	4 x 6	102 x 154	44	258
AD46747/X.						56		
AD46727/X.	4/8/15/25	130	10	5	4 x 6	102 x 154	44	261
AD46748/X.						56		
AD46801/X4	4	120	18	8	3,5 x 6	96 x 155	49,8	264
AD46810/X4	4	140	18	6	3,5 x 6	96 x 155	38	267
AD46900/M.	4/8/15	150	18	6	4 x 6	102 x 154	54	271
AD46951/X.	8/15/25	130	14,5	6	4 x 6	102 x 154	52	274
AD50720/X.	4/8/15/25	130	10	3	5,¼	131 $\phi$	43	280
AD50740/X.						55		
AD50725/X.	4/8/15/25	130	10	5	5,¼	131 $\phi$	43	283
AD50745/X.						55		
AD50800/X.M	4/8	140	18	6	5	120 $\phi$	48,5	286
AD51410/M4	4	90	18	15	5,¼	130 $\phi$	57	292
AD55720/X.	4/8/15/25	130	10	3	5,¼	131 $\phi$	43	304
AD55740/X.						55		
AD55725/X.	4/8/15/25	130	10	5	5,¼	131	43	307
AD55745/X.						55		
AD70631/M4	4	60	25	15	7	156 $\phi$	67,5	317

Table continues on next page.

$\phi$  = diameter;  $\square$  = square.

FULL RANGE LOUDSPEAKERS (continued)

basic part of type number	impedance $\Omega$	resonance frequency Hz	core diameter mm	power handling capacity W	max. dimensions			page
					flange		mounting depth mm	
					inch	mm		
AD70720/X. AD70740/X. AD70725/X. AD70745/X. AD70800/X,M AD70850/X,M AD77720/X. AD77740/X. AD77725/X. AD77745/X. AD80800/MP. 9710/M8	4/8/15/25 4/8/15/25 4/8/15/25 4/8 4/8 4/8/15/25 4/8/15/25 4/8/15/25 4/8/15/25 4/8 8	100 100 100 100/105 105 100 100 100 100 85/75 50	10 10 10 18 14,5 10 10 10 10 18 34	5 5 5 12/13 7 5 5 5 5 10/13 20	7 7 7 7 7 7 7 7 7 8 8½	160 $\phi$ 160 $\phi$ 165 $\Delta$ 165 $\Delta$ 160 $\phi$ 160 $\phi$ 160 $\phi$ 160 $\phi$ 160 $\phi$ 205 $\Delta$ 217 $\phi$	46 58 46 58 63,5 61,5 46 58 46 58 73,6 94	320 323 326 325 339 342 379 386

Note

Loudspeakers are ordered by their 12 digit catalogue number, such as e.g. 2422 257 53135. (type AD33851/Sq4). The type number is explained on page 24; the 12 digit numbers cannot be "read" since they are fixed in a numerical order. However the 11th digit refers to the packing of the loudspeakers. It can either be 0, 1, 2 or 3. The figures 0 and 1 are only applicable for **unpacked** loudspeakers 2 and 3 are for bulk-packed loudspeakers. Since we do not deliver unpacked speakers there will always be a 2 or 3 on the box and on the invoices etc. whilst the individual speakers will be stamped 0 or 1 respectively. So, referring to the above example, the individual loudspeakers will be marked 2422 257 53115 and on the box 2422 257 53135 (AD33851/Sq4). To easify the conversion from "unpacked" 12 digit number to type number please consult the following table.

$\phi$  = diameter,  $\Delta$  = octagonal.

CONVERSION LIST

Conversion of catalogue number stamped on loudspeaker to type number. See relevant data sheet for ordering number.

catalogue number	type number	page
2403 256 12401	AD01985/Y25	38
	Y15	38
	Y8	38
	AD01980/Y25	35
	Y15	35
	Y8	35
2403 257 20001	AD35720/X4	164
	X8	164
	X15	164
	X25	164
	AD35740/X4	164
	X8	164
	X15	164
	X25	164
	AD35721/X4	167
	X8	167
	X15	167
	X25	167
	AD35741/X4	167
	X8	167
	X15	167
	X25	167
	AD35722/X4	170
	X8	170
	X15	170
	X25	170
	AD35742/X4	170
	X8	170
	X15	170
	X25	170
	AD3371/Y4	54
	Y8	54
	Y15	54
	Y25	54
	Y50	54
	Y150	54
	AD3071/Y4	54
	Y8	54
	Y15	54
	Y25	54
	Y50	54
	Y150	54
	AD2071/Z4	51
	Z8	51
	Z15	51
	Z25	51
	Z150	51
	Z50	51

catalogue number	type number	page
2403 257 24205	AD4072/X4	59
	X8	59
	X15	59
	X25	59
	AD4074/X4	63
	X8	63
	X15	63
	X25	63
	AD4474/X4	63
	X8	63
	X15	63
	X25	63
	AD4472/X4	59
	X8	59
	X15	59
	X25	59
	AD50720/X4	281
	X8	281
	X15	281
	X25	281
	AD50740/X4	281
	X8	281
	X15	281
	X25	281
	AD55740/X4	305
	X8	305
	X15	305
	X25	305
	AD55720/X4	305
	X8	305
	X15	305
	X25	305
	AD36720/X4	185
	X8	185
	X15	185
	X25	185
	AD36740/X4	185
	X8	185
	X15	185
	X25	185
	AD36722/X4	188
	X8	188
	X15	188
	X25	188
	AD36742/X4	188
	X8	188
	X15	188
	X25	188

catalogue number	type number	page
2403 257 27101	AD70720/X4	321
27102	X8	321
27103	X15	321
27104	X25	321
27201	AD70740/X4	321
27202	X8	321
27203	X15	321
27204	X25	321
27801	AD77740/X4	340
27802	X8	340
27803	X15	340
27804	X25	340
27901	AD77720/X4	340
27902	X8	340
27903	X15	340
27904	X25	340
29001	AD46720/X4	247
29002	X8	247
29003	X15	247
29004	X25	247
29101	AD46740/X4	247
29102	X8	247
29103	X15	247
29104	X25	247
29201	AD46721/X4	250
29202	X8	250
29203	X15	250
29204	X25	250
29301	AD46741/X4	250
29302	X8	250
29303	X15	250
29304	X25	250
29401	AD46722/X4	253
29402	X8	253
29403	X15	253
29404	X25	253
29501	AD46742/X4	253
29502	X8	253
29503	X15	253
29504	X25	253
32102	AD01700/T8	28
32902	AD11700/T8	28
50001	AD35725/X4	173
50002	X8	173
50003	X15	173
50004	X25	173
50101	AD35746/X4	173
50102	X8	173
50103	X15	173
50104	X25	173
50201	AD35726/X4	176
50202	X8	176
50203	X15	176
50204	X25	176

catalogue number	type number	page
2403 257 50301	AD35747/X4	176
50302	X8	176
50303	X15	176
50304	X25	176
50401	AD35727/X4	179
50402	X8	179
50403	X15	179
50404	X25	179
50501	AD35748/X4	179
50502	X8	179
50503	X15	179
50504	X25	179
54205	AD40725/X4	216
54206	X8	216
54207	X15	216
54208	X25	216
54305	AD40745/X4	216
54306	X8	216
54307	X15	216
54308	X25	216
54705	AD44745/X4	228
54706	X8	228
54707	X15	228
54708	X25	228
54805	AD44725/X4	228
54806	X8	228
54807	X15	228
54808	X25	228
55101	AD50725/X4	284
55102	X8	284
55103	X15	284
55104	X25	284
55201	AD50745/X4	284
55202	X8	284
55203	X15	284
55204	X25	284
55801	AD55745/X4	308
55802	X8	308
55803	X15	308
55804	X25	308
55901	AD55725/X4	308
55902	X8	308
55903	X15	308
55904	X25	308
56001	AD36725/X4	191
56002	X8	191
56003	X15	191
56004	X25	191
56101	AD36746/X4	191
56102	X8	191
56103	X15	191
56104	X25	191

catalogue number	type number	page
2403 257 56401	AD36727/X4	194
56402	X8	194
56403	X15	194
56404	X25	194
56501	AD36748/X4	194
56502	X8	194
56503	X15	194
56504	X25	194
57101	AD70725/X4	324
57102	X8	324
57103	X15	324
57104	X25	324
57201	AD70745/X4	324
57202	X8	324
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## TERMS AND DEFINITIONS

*Unmounted:* The loudspeaker is clamped in a set-up that does not influence its radiation characteristics.

*Mounted in enclosure:* The loudspeaker is front mounted in an enclosure of the dimensions specified on the data sheet.

*Baffle:* The loudspeaker is fitted to a baffle of the dimensions specified on the data sheet (flush mounted or front mounted).

*Half free field:* The acoustic conditions on the forward side approach those of free space.

*Anechoic room:* The acoustic conditions approach those of free space (IEC Publication 268, Part 5, Section 1).

*Operating power:* This is the sinewave power input to the loudspeaker which corresponds with a sound level

- of 74 dB at a microphone distance of 0,5 m for small low power speakers;
- of 90 dB at a microphone distance of 0,5 m for standard low power speakers;
- of 96 dB at a microphone distance of 1 m for medium and high power loudspeakers.

This sound level is the average level over the rated frequency range of the loudspeaker. 0 dB corresponds with  $2 \times 10^{-5} \text{ N/m}^2$ .

*Maximum power:* The power of a continuous sinusoidal signal within the rated frequency range that the loudspeaker element or system can handle at an ambient temperature of 25 °C for ten minutes without any damage, e.g. either thermal or mechanical deformation.

*Characteristic sensitivity:* The sound pressure (level) in a stated frequency range referred to an input power of 1 W at a distance of 1 m on the reference axis. This characteristic sensitivity of 1W/1 m cannot be given for small low power speakers.

*Compliance:* The reciprocal of the axial stiffness of the total suspension.

## TEST METHODS AND MEASUREMENTS

The atmospheric conditions for measurement are:

Temperature :	15 to 35 °C
Relative humidity :	45 to 75 %
Pressure :	860 to 1060 hPa

### 1 Impedance

The impedance is the modulus of the lowest value of the electrical impedance in the frequency range above the bass resonance frequency of the loudspeaker as determined by the method specified in 3 below.

#### 1.1 Measuring apparatus

See under 3. In Fig. 1,  $R = 1 \Omega$ .

#### 1.2 Conditions

- The loudspeaker is unmounted.
- The power input to the loudspeaker must not exceed 0,1 x the power-handling capacity as determined in 4 below.

#### 1.3 Measuring result

Rated impedance is stated in the data sheets. The measured impedance should not be lower than 20% of the rated impedance.

### 2 Voice coil resistance

The voice coil resistance is the d.c. resistance of the voice coil.

#### 2.1 Measuring apparatus

Low current d.c. ohmmeter.

#### 2.2 Conditions

The d.c. power input to the loudspeaker must not exceed 0,1 x the power-handling capacity.

#### 2.3 Measuring result

The rated resistance is given in the data sheets, tolerance  $\pm 20\%$ .

### 3 Resonance frequency

The resonance frequency is the frequency at which the modulus of the electrical impedance has its first principal maximum in an ascending scale, the electrical input being such as to have no significant effect on the resonance frequency.



### 3.1 Measuring apparatus

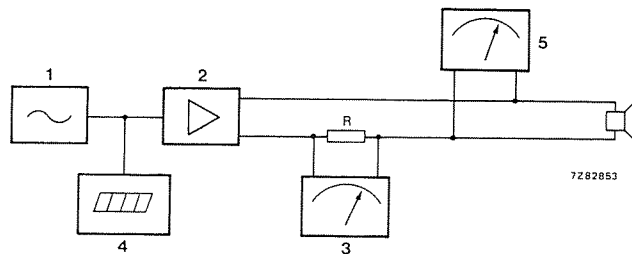


Fig. 1.

- (1) Sinewave generator, Philips PM5126.  
 (2) Power amplifier.  
 (3) and (5) a.c. mV meter, Philips PM2454.  
 (4) Frequency counter, Philips PM6620.

} or equivalents

$R = 0,1 \Omega$ .

### 3.2 Conditions

- the loudspeaker is unmounted.
- Resonance frequency is measured at least 24 hours after fabrication of the loudspeaker.
- No measurements or tests are carried out before measurement of the resonance frequency.
- Power on the loudspeaker: 1 W; for small low power speakers 0,1 x the power handling capacity.

### 3.3 Measuring result

The resonance frequency is that frequency at which the voltmeter indicates the first minimum deflection as the frequency is swept slowly from 0 Hz.

The resonance frequency is stated in the data sheets, tolerance  $\pm 15\%$ .

## 4 Power handling capacity

The power handling capacity is the nominal power that the loudspeaker will satisfactorily handle as checked by an accelerated life test.

### 4.1 Measuring apparatus

- Generator supplying test signal in accordance with IEC Publication 268, Part 5, Section 9.3.
- Power amplifier with an output impedance not greater than 1/3 of the rated impedance of the loudspeaker.
- Voltmeter indicating the r.m.s. value of the voltage.

### 4.2 Conditions

- A test voltage is applied to the loudspeaker for an uninterrupted period of 100 h. The r.m.s. value of this voltage corresponds to the specified power handling capacity of the loudspeaker.
- The test voltage has a frequency distribution corresponding to that of the output of a filter as specified in IEC Publication 268, Part 5, Section 9.3 when fed from a white noise source.
- If the loudspeaker is designed to operate in a restricted frequency range, the corresponding network (filter) connected to the loudspeaker during the test, is specified in the data sheet. The test voltage is measured at the input terminals of the network.

- The method of mounting is as specified in the data sheet.

### 4.3 Measuring result

To pass this test the loudspeaker has to function properly at the end of the test period. Deviation from the specified resonance frequency is allowed. Refer to 11 (Life test).

## 5. Total non-linear distortion

This is the ratio between the r.m.s. value of the harmonic content of the sound pressure to the total sound pressure over the frequency range of the loudspeaker.

The difference in dB between fundamentals and harmonics can be converted into a distortion percentage with the aid of following nomogram.

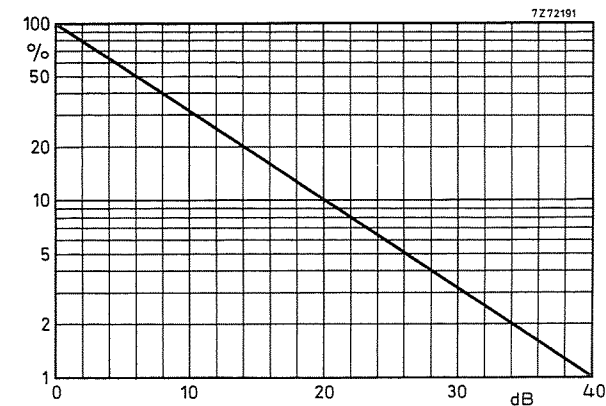


Fig. 2 Difference in dB converted into % distortion.

## 5.1 Measuring apparatus

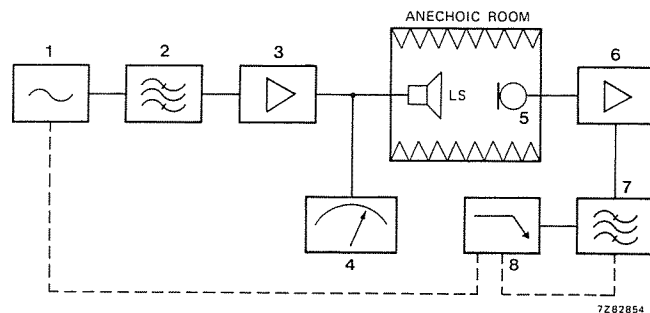


Fig. 3.

- (1) Sinewave generator, Bruel & Kjaer, type 1027.
- (2) Bandpass filter, Krohn - Hite, type 3700.
- (3) Power amplifier, Bruel & Kjaer, type 2706.
- (4) Electronic voltmeter, Bruel & Kjaer, type 2425.
- (5) Microphone, Bruel & Kjaer, type 4145.
- (6) Measuring amplifier, Bruel & Kjaer, type 2608.
- (7) Bandpass filter set, Bruel & Kjaer, type 1615.
- (8) Level recorder, Bruel & Kjaer, type 2307.

or equivalents

## 5.2 Conditions

- The loudspeaker is mounted as specified in the data sheet.
- The power input to the loudspeaker is the operating power (see under Terms and Definitions).
- The microphone distance is 1 m unless otherwise specified in the data sheet.

## 5.3 Measuring result

The distortion curve for high power loudspeakers is given in the data sheet.

## 6 Sweep voltage

The sweep voltage test involves the loudspeaker receiving a sinusoidal test signal of specified constant amplitude. The frequency of this signal is swept through the specified frequency range.

## 6.1 Measuring apparatus

- Audio-frequency sinewave generator with a constant output voltage over the range from 0 to 20 000 Hz.
- Linear amplifier with an output power appropriate to the loudspeaker under test and an output impedance not greater than 1/3 x the rated loudspeaker impedance. For power see 6.2.
- An electronic voltmeter with high input impedance.

## 6.2 Conditions

- The loudspeaker is unmounted.
- The input voltage is:
  - (a) for the *medium and low power range* such that the power input to the loudspeaker is 0,5 x the specified power handling capacity.
  - (b) for the *high power range* as specified in the data sheets.
- If the loudspeaker is designed to operate in a restricted frequency range, the corresponding network (filter) is connected to the loudspeaker during the test, is specified in the data sheet. The test voltage is measured at the input terminals of the network.

## 6.3 Measuring result

The sound reproduction must be correct and undistorted. (The faults can be classified according to the fault list mentioned in 'Procedure of inspection for loudspeakers').

## 7 Flux density

This is the magnetic flux density measured in the air gap.

## 7.1 Measuring apparatus

- Differential search coil pair.
- Galvanometer.

## 7.2 Conditions

- The distance between the centres of the two coils is equal to the air-gap height minus 1 mm.
- The two coils are put into the air gap symmetrical with respect to the pole plate.

## 7.3 Measuring result

The minimum flux density as measured on production samples is stated in the data sheet.

## 8 Frequency response

The frequency response is the graph representing the sound pressure as a function of frequency when a constant sinewave signal is applied to the loudspeaker.

## 8.1 Measuring apparatus

- Microphone, Bruel & Kjaer, type 4131, 4145.
- Microphone amplifier, Bruel & Kjaer, type 2606, 2607, 2608.
- Cathode follower, Bruel & Kjaer, type 2619.
- Sinewave random generator, Bruel & Kjaer, type 1024.
- Level recorder, Bruel & Kjaer, type 2305, 2307.

or equivalents

The apparatus is set as follows:

- Writing speed, 125 mm/s
- Paper speed, 3 mm/s
- Range potentiometer, 50 dB
- Lower limiting frequency, 10 Hz
- Rectifier response, r.m.s.
- Writing width, 100 mm
- Compressor speed, 300 dB/s

### 8.2 Conditions

- Sinewave signal  $V = \sqrt{P \cdot Z_r}$ ,

where:

for anechoic room measurements  $P = 50 \text{ mW}$ , unless otherwise stated in the data sheets.

$V$  = test voltage,

$Z_r$  = rated impedance as specified in the data sheet.

- Microphone position: in axis of loudspeaker at a distance of 0,5 m for anechoic room measurements.

### 8.3 Measuring result

A description of the sensitivity and the frequency response curve(s) are given in the data sheet.

## 9 Direction of magnetization

The magnet is so magnetized that the centre-pole is *south* for systems with a ring magnet, and *north* for systems with a slug magnet.

## 10 Polarity

The cone of the loudspeaker will move outwards when a d.c. voltage is applied to the terminals so that the red terminal or + sign is positive. The voltage applied must not exceed the "sweep voltage".

## 11 Life test

### 11.1 Measuring apparatus

- Pink noise generator, Bruel & Kjaer, type 1405 or equivalent.
- Filter and limiting circuit.
- Emitter follower.
- Power amplifier.
- Electronic r.m.s. voltmeter, Bruel & Kjaer, type 2425 or equivalent.

For tests on tweeters and squawkers a high-pass filter, as mentioned in the data sheet for power handling capacity measurement, must be used between amplifier and speaker.

### 11.2 Conditions

The output of the generator must be adjusted so that the output peak voltage of the limiter is twice the r.m.s. value.

Voltage on the loudspeaker:

$$V_{\text{rms}} = \sqrt{P \cdot Z_r}$$

$P$  = power handling capacity of the relevant loudspeaker.

$Z_r$  = rated impedance as specified in the data sheet.

The loudspeaker will have been tested mounted in an enclosure, if it is mentioned in the relevant data sheet.

### 11.3 Measuring result

After 100 hours the speaker must still meet the requirements stated in the data sheet, except for the resonance frequency, which may be fall to 85% of its zero-hour value.

## 12 Climatic tests

test	procedure	recovery time	requirements
dry heat	7 days at + 70 °C, loudspeaker unloaded	4 h	
change of temperature	24 h at -25 °C      loudspeaker 8 - 12 h at + 25 °C      unloaded 24 h at + 70 °C 4 h at + 25 °C	–	no important changes in electrical, mechanical and acoustical properties, except for the resonance frequency
humidity cycle	12 h at + 45 °C, 85% R.H. 12 h at + 25 °C, 100% R.H., 21 days	4 h	
endurance	100 h at + 45 °C loudspeaker loaded with P.H.C. ref. IEC publ. 268-5-9	4 h	

## PROCEDURE FOR INSPECTION

This procedure applies:

- for measuring the quality of loudspeakers lots, packed and ready for dispatch to a receiver/user.
- for batch acceptance.

It provides the specification of defects on loudspeakers after inspection by attributes. The types of inspection are: visual inspection, auditory inspection and several measurements. If necessary additional information can be laid down in the Specific Conditions of the Quality Agreement regarding to the deliveries between supplier and customer.

A *defect* is any non-conformance of the loudspeaker with its specified requirements.

A *major defect* is a defect that is likely to result in failure or to reduce materially the usability of the loudspeaker.

A *minor defect* is a defect that is not likely to reduce materially the usability of the loudspeaker, or is a departure from established standards having little bearing on the effective operation of the loudspeaker.

### Main rules

All independent defects found during inspection must be used for quality evaluation. All epidemic defects must be taken into account.

When more defects appear from the same cause, only the most serious defect must be taken into account.

The evaluation must be within the limits of the specification of the loudspeaker and for unspecified characteristics must be related to an approval model or limit samples.

### Expression of non-conformance

The extent of non-conformance can be expressed in one or more figures:

- one major and one minor figure for visual and auditory inspection together.
- separate major and minor figures for visual inspection, auditory inspection and measurements.

### Acceptability of lots or batches

The AQLs, inspection level(s) and batch sizes are selected according to the specific conditions of the Quality Agreement between supplier and customer.

**Visual inspection** (workmanship and appearance)

Defects concerning packaging, labelling, and loose dirt or unusual material between the loudspeakers are not classified but reported separately.

Incorrect type or not identifiable type.

(Partly) missing, incorrect or unreadable marking.

Missing parts.

Missing plating/coating.

Partly missing plating/coating, or corrosion.

Missing connection/joint (soldering, gluing, screwing, riveting, pinning, sealing).

Missing or double polarity marking; incorrect polarity indication.

Short-circuit or chance of short-circuit

Tag terminal having poor solderability or plugability

Mounting in application impossible due to incorrect mechanical dimensions.

Dirt, stains, spots (glue, tin, ink, paint), incorrect plating/coating or damaging on car radio boxes or on that part of the loudspeaker which is visible in an open box.

Damaged or wrong parts, or incorrectly mounted parts.

Incorrect or bad connection/joint (soldering, gluing, etc.).

Dirt, stains, spots (glue, tin, ink, paint) or incorrect plating/coating which is not visible in the application.

**Auditory inspection**

Inoperative or interruptions

Audible low level

Dissonance

Grating or rattling

Rustling

Shrilling

Distortion

	defects	
	major	minor
Incorrect type or not identifiable type.	X	
(Partly) missing, incorrect or unreadable marking.		X
Missing parts.	X	
Missing plating/coating.	X	
Partly missing plating/coating, or corrosion.		X
Missing connection/joint (soldering, gluing, screwing, riveting, pinning, sealing).	X	
Missing or double polarity marking; incorrect polarity indication.	X	
Short-circuit or chance of short-circuit	X	
Tag terminal having poor solderability or plugability	X	
Mounting in application impossible due to incorrect mechanical dimensions.	X	
Dirt, stains, spots (glue, tin, ink, paint), incorrect plating/coating or damaging on car radio boxes or on that part of the loudspeaker which is visible in an open box.	X	X
Damaged or wrong parts, or incorrectly mounted parts.	X	X
Incorrect or bad connection/joint (soldering, gluing, etc.).	X	X
Dirt, stains, spots (glue, tin, ink, paint) or incorrect plating/coating which is not visible in the application.		X
Inoperative or interruptions	X	
Audible low level	X	
Dissonance		
Grating or rattling	X	
Rustling	X	X
Shrilling	X	X
Distortion	X	X

**Measurements**

(only for loudspeakers in approved hi-fi applications)

*Resonance frequency*

Deviation more than 30% from nominal value.  
Deviation outside tolerance.

*Voice coil resistance*

Outside twice tolerance.  
Outside tolerance.

*Frequency response curve*

Sensitivity:

Deviation more than 2 dB from nominal value.

Shape:

Curve over a bandwidth more than one octave outside tolerance.

Curve over a bandwidth more than 1/3 octave outside tolerance.

*Distortion*

Outside the requirements according to DIN 45 500.

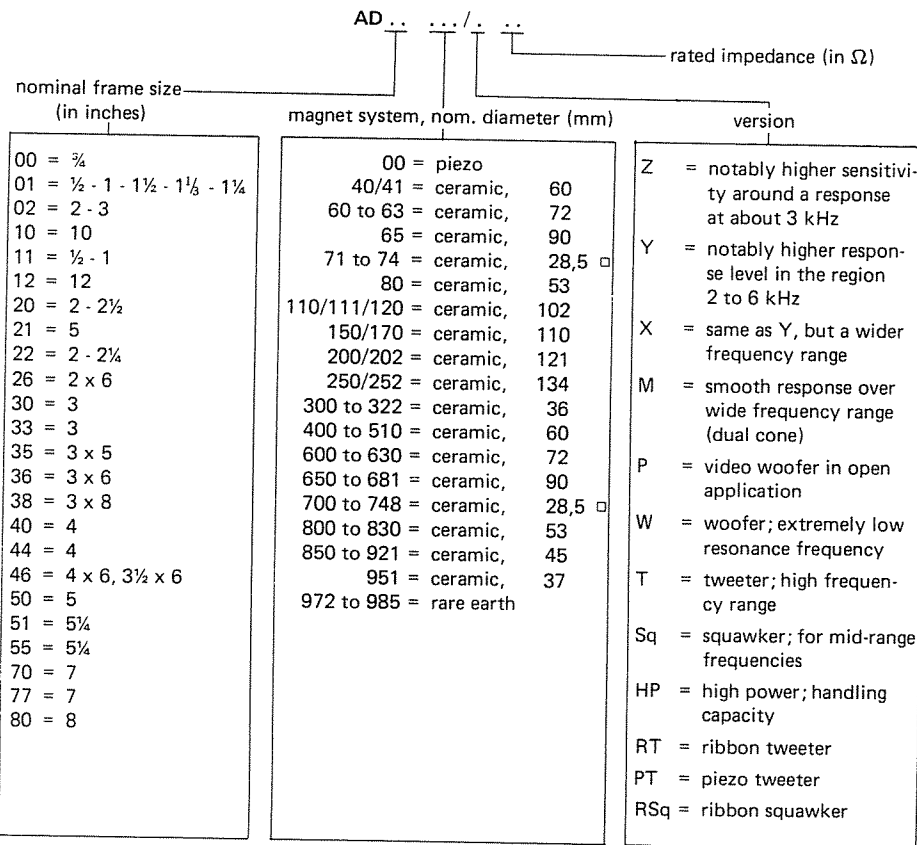
*Incorrect polarity*

P.H.C. test

Damaged parts, loose connection/joint or any other defect mentioned under auditory inspection or measurements (except resonance frequency) appeared at the life test in a period of maximum 100 hours.

	defects	
	major	minor
Deviation more than 30% from nominal value. Deviation outside tolerance.	X	X
Outside twice tolerance. Outside tolerance.	X	X
Deviation more than 2 dB from nominal value.	X	
Curve over a bandwidth more than one octave outside tolerance.	X	
Curve over a bandwidth more than 1/3 octave outside tolerance.		X
Outside the requirements according to DIN 45 500.	X	
	X	
	X	

TYPE NUMBER SYSTEM



3/4 inch HI-FI DOME TWEETER LOUDSPEAKER

TECHNICAL DATA

Rated impedance	4 $\Omega$
Voice coil resistance	3 $\Omega$
Rated frequency range	1500 to 15 000 Hz
Resonance frequency	max. 2100 Hz
Power handling capacity, measured with filter 4,7 $\mu$ V	10 W
Maximum power on loudspeaker	1 W
Operating power (sound level 90 dB, 1m)	4 W
Sweep voltage (1 to 20 kHz)	2 V
Filter	4,7 $\mu$ F
Energy in air gap	17,15 mJ
Flux density	0,8 T
Air-gap height	1,8 mm
Voice coil height	2 mm
Core diameter	18,11 mm
Magnet material	anisotropic cobalt samarium
diameter	17,45 mm
mass	0,005 kg
Mass of loudspeaker	0,035 kg

Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering.

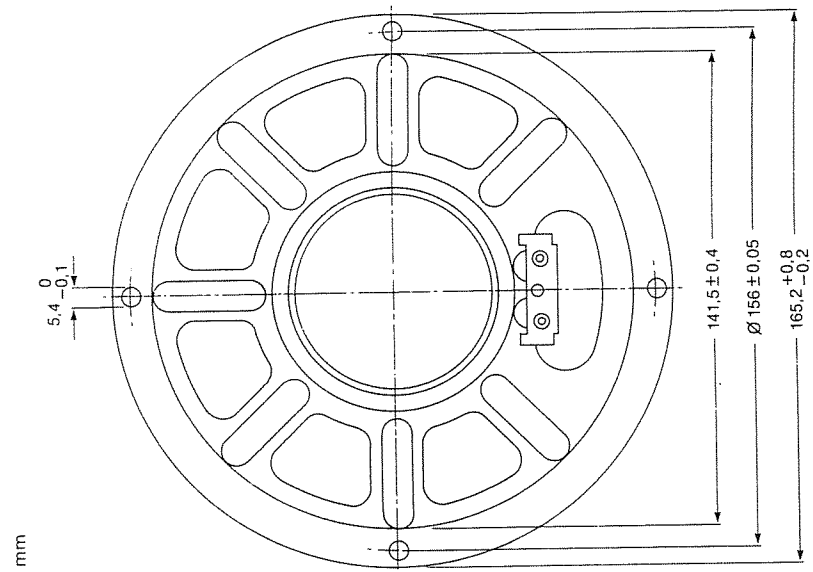
## 7 inch WOOFER LOUDSPEAKER

- frame: steel, zinc plated, yellow
- cone: paper, black
- surround: textile
- application:
- gaskets: none
- magnetic compensation: none
- recommended enclosure: 15 litre

## TECHNICAL DATA

Rated impedance	8 $\Omega$
Voice coil resistance	6,9 $\Omega$
Rated frequency range	up to 8000 Hz
Resonance frequency	74 Hz
Power handling capacity, measured without filter, loudspeaker unmounted	30 W
Max. power on loudspeaker	45 W
Operating power (sound level 96 dB, 1 m)	8 W
Sweep voltage (20 to 20 000 Hz)	5,5 V
Filter	none
Characteristic sensitivity	87 dB
Energy in air gap	75 mJ
Flux density	1,17 T
Force factor (Bxl) at 1 A	3,7 Wb/m
Piston area	0,0123 m <sup>2</sup>
Total moving mass	6,3 x 10 <sup>-3</sup> kg
Compliance, loudspeaker unmounted	0,81 x 10 <sup>-3</sup> m/N
Equivalent box volume	14,7 l
Quality factor, loudspeaker mounted in recommended volume	
mechanical	4,12
electrical	2,07
total	1,37
Air-gap height	3 mm
Air-gap length	0,845 mm
Voice coil height	6,5 mm
Rated coil diameter	18 mm
Magnet material	ceramic
diameter	60 mm
mass	0,15 kg
Mass of loudspeaker	0,39 kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.



Dimensions in mm

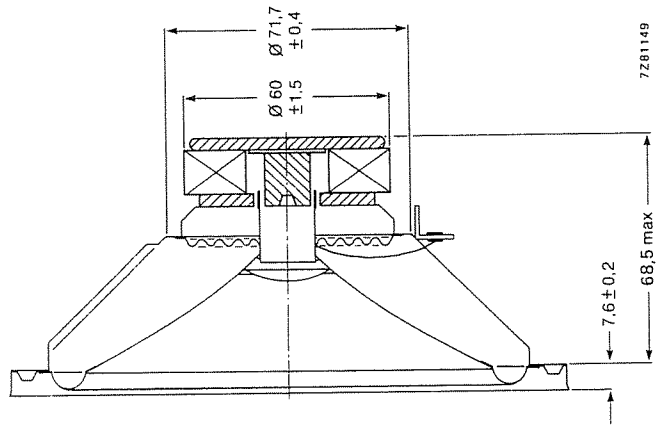


Fig. 1.

\* Recommended baffle opening (Ø 144 mm) and mounting clearance (5 mm) are required for cone movement at the specified power handling capacity. One tag has a mark to facilitate phase matching.

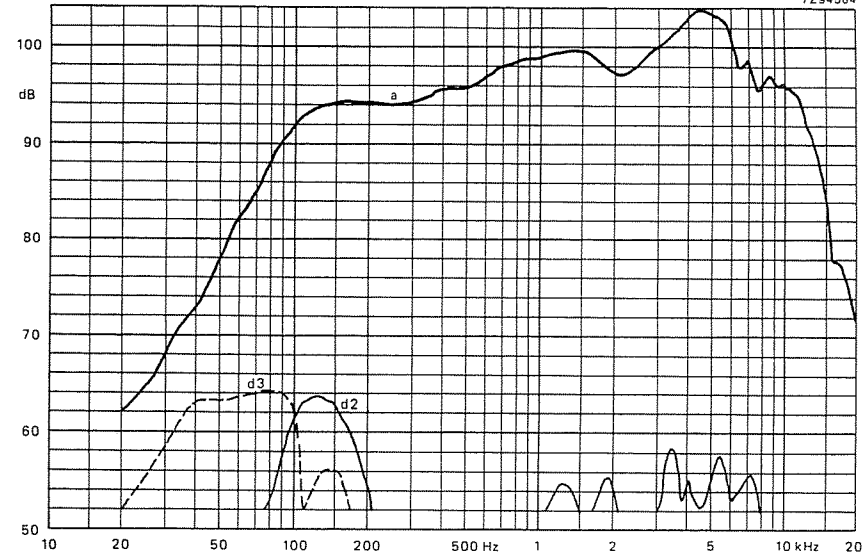


Fig. 2.

**AVAILABLE VERSION**

AD70400/W8. catalogue number 2422 257 27222 This number is for bulk-packed loudspeakers.

**FREQUENCY RESPONSE CURVES** (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure

Curves d2 and d3: 2nd and 3rd harmonic distortion.

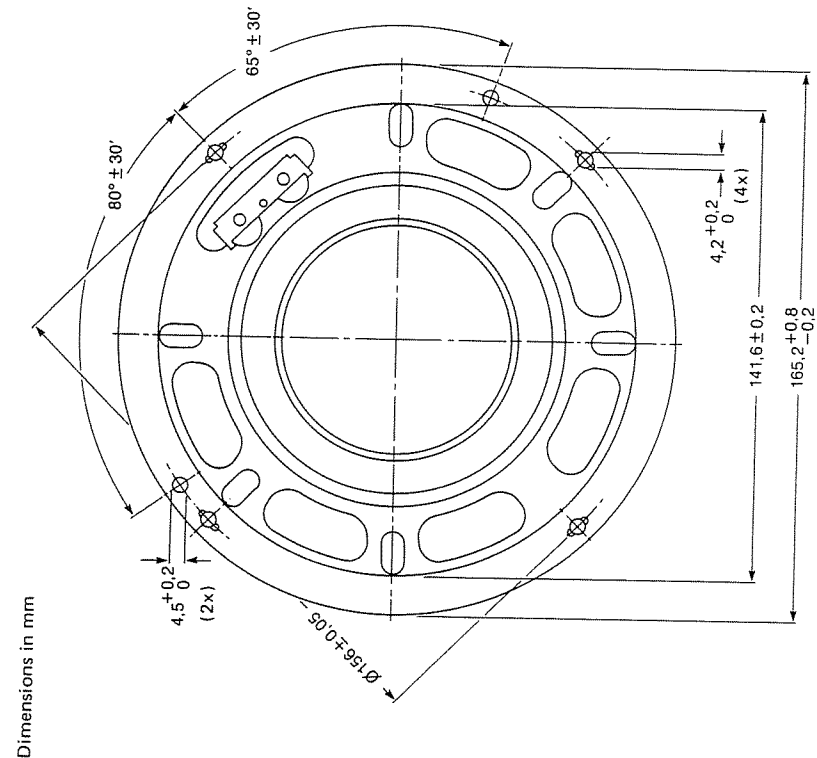
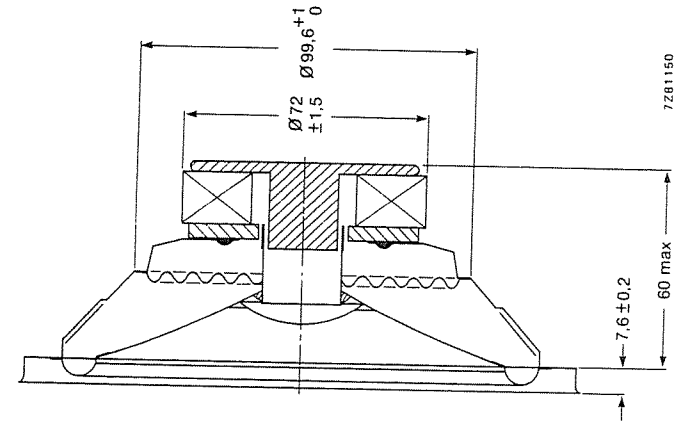
## 7 inch WOOFER LOUDSPEAKER

- frame: steel, zinc plated, yellow
- cone: paper, black
- surround: foam
- gaskets: none
- magnetic compensation: none
- recommended enclosure: 15 litre

## TECHNICAL DATA

Rated impedance	4 $\Omega$
Voice coil resistance	3,5 $\Omega$
Rated frequency range	up to 5000 Hz
Resonance frequency	48 Hz
Power handling capacity, measured without filter, loudspeaker unmounted, 100 h continuous	40 W
Max. power on loudspeaker	80 W
Operating power (sound level 96 dB, 1 m)	10 W
Sweep voltage (20 to 6000 Hz)	6,3 V
Filter	none
Characteristic sensitivity	86 dB
Energy in air gap	137 mJ
Flux density	0,72 T
Force factor (Bxl) at 1A	4,7 Wb/m
Piston area	133 cm <sup>2</sup>
Total moving mass	13 g
Compliance, loudspeaker unmounted	$0,84 \times 10^{-3}$ m/N
Equivalent box volume	17,8 l
Quality factor, loudspeaker unmounted	
mechanical	4,2
electrical	1,16
total	1,15
Air-gap height	5 mm
Air-gap length	1,6 mm
Voice coil height	7 mm
Rated coil diameter	25 mm
Magnet material	ceramic
diameter	72 mm
mass	0,24 kg
Mass of loudspeaker	0,75 kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.



Dimensions in mm

Fig. 1.  
Recommended baffle opening ( $\phi$  144 mm) and mounting clearance (5 mm) are required for cone movement at the specified power handling capacity. One tag has a mark to facilitate phase matching.



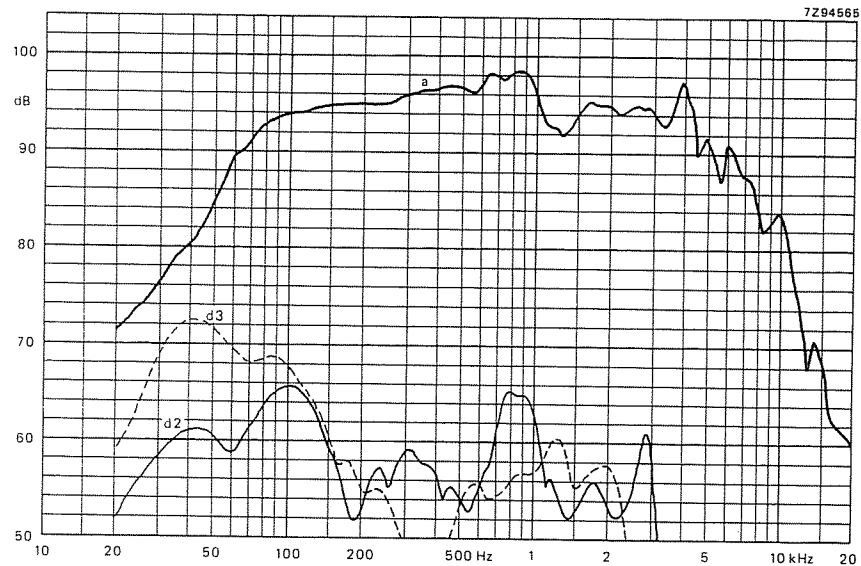


Fig. 2.

**AVAILABLE VERSION**

AD70604/W4. catalogue number 2422 257 47133 This number is for bulk packed loudspeakers.

**FREQUENCY RESPONSE CURVES (see Fig. 2)**

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure

Curves d2 and d3: 2nd and 3rd harmonic distortion.

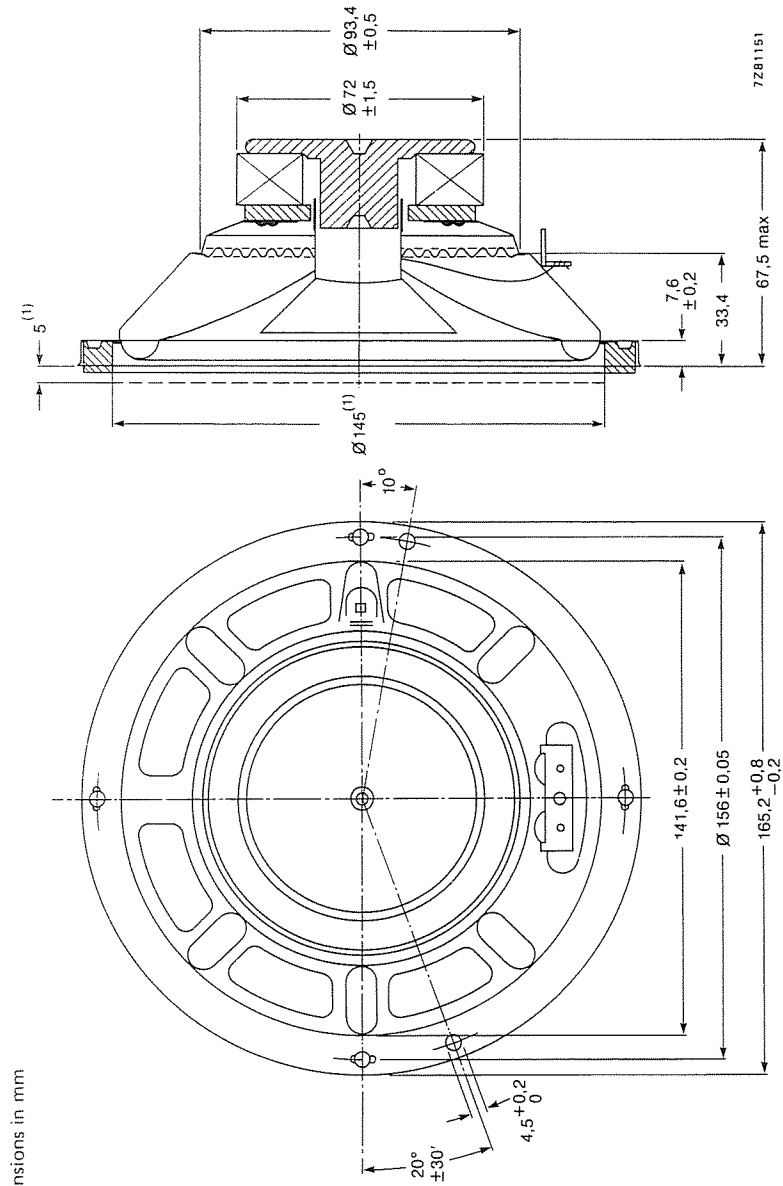
**7 inch HIGH EFFICIENCY LOUDSPEAKER**

- frame: steel, black
- cone: paper, black
- surround: textile

**TECHNICAL DATA**

Rated impedance	4 $\Omega$
Voice coil resistance	3,2 $\Omega$
Rated frequency range	up to 20 000 Hz
Sensitivity	91 dB
Resonance frequency	60 Hz
Power handling capacity, measured without filter, loudspeaker unmounted	15 W
Max. power on loudspeaker	25 W
Operating power (sound level 96 dB, 1 m)	3 W
Sweep voltage (35 to 20 000 Hz)	5,5 V
Filter	none
Energy in air gap	127 mJ
Flux density	0,87 T
Air-gap height	5 mm
Voice coil height	6 mm
Rated core diameter	25 mm
Magnet material	ceramic
diameter	72 mm
mass	0,26 kg
Mass of loudspeaker	0,652 kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.



Dimensions in mm

Fig. 1.

Recommended baffle opening ( $\varnothing 145 \text{ mm}$ ) and mounting clearance ( $5 \text{ mm}$ ) are required for cone movement at the specified power handling capacity. One tag has a + mark to facilitate phase matching.

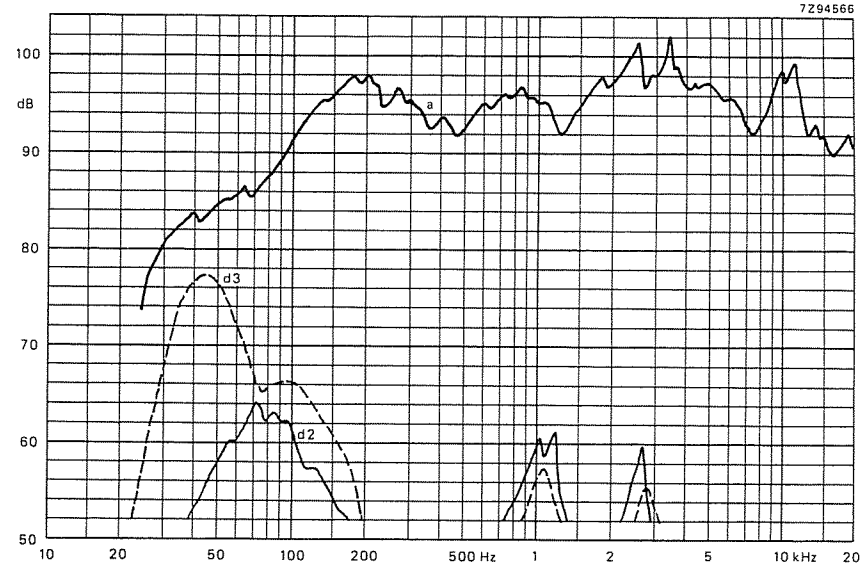


Fig. 2.

**AVAILABLE VERSIONS**

AD70631/M4 catalogue number 2422 257 47126 This number is for bulk-packed loudspeakers.

**FREQUENCY RESPONSE CURVES**

Measured in anechoic room at the operating power. Loudspeaker front mounted on 1EC baffle.

Curve a: Sound pressure

Curves d2 and d3: 2nd and 3rd harmonic distortion.

## 7 inch LOW POWER LOUDSPEAKERS

### APPLICATION

Round loudspeaker for audio and video applications. AD70740 has a screened magnet system.

### TECHNICAL DATA

	version			
	X4	X8	X15	X25
Rated impedance	4	8	15	25 $\Omega$
Voice coil resistance	3,5	7,1	13,7	22,8 $\Omega$
Rated frequency range	70 to 13 000			Hz
Resonance frequency	100			Hz
Power handling capacity, measured without filter, loudspeaker unmounted	5			W
Operating power (sound level 90 dB, 1 m)	400			mW
Sweep voltage (100 to 20 000 Hz)	2,4	3,5	4,7	6,1 V
Filter	none			
Energy in air gap	12,7			mJ
Flux density	0,74			T
Air-gap height	2,5			mm
Voice coil height	2,7	2,2	3,0	3,6 mm
Core diameter	10			mm
Magnet material	ceramic			
square	28,5			mm
mass	18			g
Mass of loudspeaker	106			g

Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering. The loudspeaker has a plastic frame and a paper cone.

→ Screened and compensated loudspeakers are available on request.

Dimensions in mm

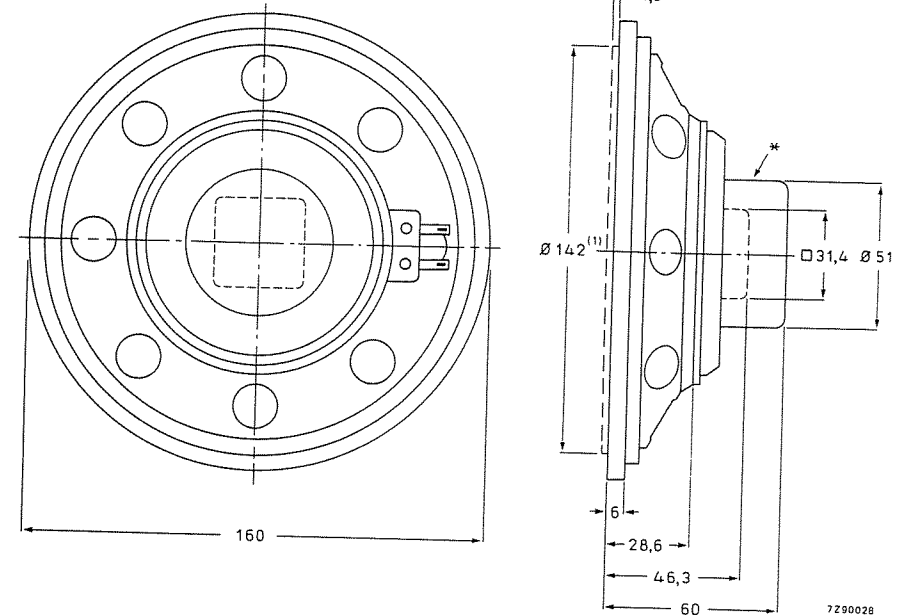


Fig. 1.

\* Screening for AD70740/X only.

(1) Recommended baffle opening ( $\phi$  142 mm) and clearance depth (1,5 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

### AVAILABLE VERSIONS

AD70720/X4	catalogue number 2403 257 27121
AD70720/X8	catalogue number 2403 257 27122
AD70720/X15	catalogue number 2403 257 27123
AD70720/X25	catalogue number 2403 257 27124

AD70740/X4	catalogue number 2403 257 27221
AD70740/X8	catalogue number 2403 257 27222
AD70740/X15	catalogue number 2403 257 27223
AD70740/X25	catalogue number 2403 257 27224

These numbers are for bulk-packed loudspeakers.

### FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

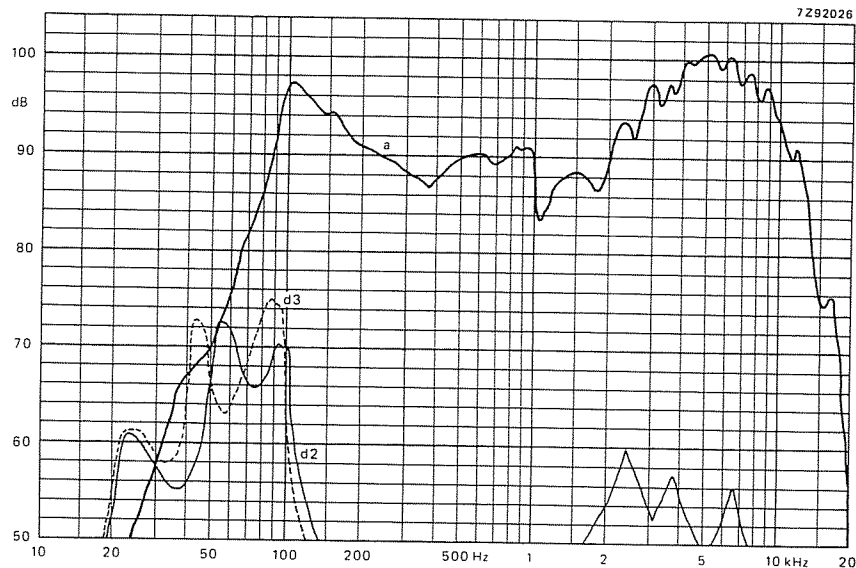


Fig. 2.

## 7 inch LOW POWER LOUDSPEAKERS

### APPLICATION

Round loudspeaker for audio and video applications. AD70745 has a screened magnet system.

### TECHNICAL DATA

	version			
	X4	X8	X15	X25
Rated impedance	4	8	15	25 $\Omega$
Voice coil resistance	3,5	7,1	13,7	22,8 $\Omega$
Rated frequency range	70 to 13 000			Hz
Resonance frequency	100			Hz
Power handling capacity, measured without filter, loudspeaker unmounted	5			W
Maximum power on loudspeaker	7			W
Operating power (sound level 90 dB, 0,5 m)	400			mW
Sweep voltage (100 to 20 000 Hz)	2,4	3,5	4,7	6,1 V
Filter	none			
Energy in air gap	12,7			mJ
Flux density	0,74			T
Air-gap height	2,5			mm
Voice coil height	2,7	2,2	3,0	3,6 mm
Core diameter	10			mm
Magnet material	ceramic			
square	28,5			mm
mass	18			g
Mass of loudspeaker				
AD70725	100			g
AD70745	120			g

Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering.

The loudspeaker has a plastic frame and a paper cone.

Screened and compensated loudspeakers are available on request.

Dimensions in mm

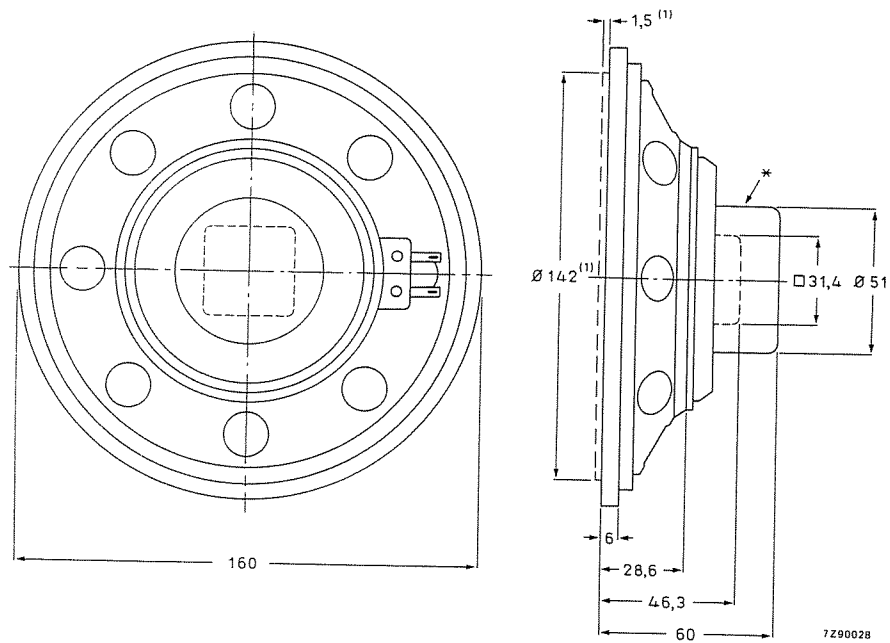


Fig. 1.

\* Screening for AD70745/X only.

(1) Recommended baffle opening ( $\phi$  142 mm) and clearance depth (1,5 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

AVAILABLE VERSIONS

AD70725/X4	catalogue number 2403 257 57121
AD70725/X8	catalogue number 2403 257 57122
AD70725/X15	catalogue number 2403 257 57123
AD70725/X25	catalogue number 2403 257 57124
AD70745/X4	catalogue number 2403 257 57221
AD70745/X8	catalogue number 2403 257 57222
AD70745/X15	catalogue number 2403 257 57223
AD70745/X25	catalogue number 2403 257 57224

These numbers are for bulk-packed loudspeakers

FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

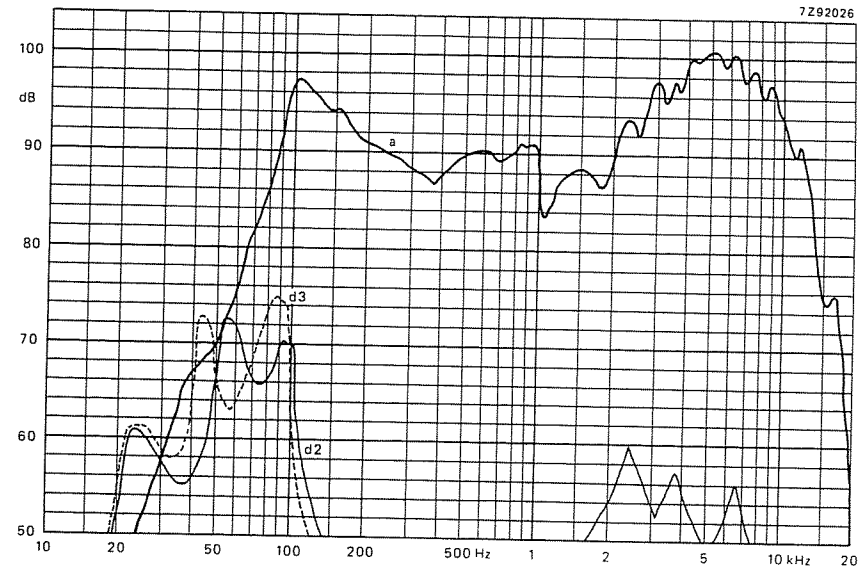


Fig. 2.

## 7 inch OCTAGONAL HIGH POWER LOUDSPEAKER

## APPLICATION

A full range loudspeaker for all audio applications.

## TECHNICAL DATA

	version			
	X4	X8	M4	M8
Rated impedance	4	8	4	8 Ω
Voice coil resistance	3,4	7	3,4	7 Ω
Rated frequency range	50 to 10 000		60 to 16 000 Hz	
Resonance frequency	105		100	105 Hz
Power handling capacity, measured without filter, loudspeaker unmounted	12		13 W	
Operating power (sound level 90 dB, 1 m)	0,7		0,75	0,65 W
Sweep voltage (50 to 20 000 Hz)	4,9	6,9	5,1	7,2 V
Energy in air gap	53		53 mJ	
Flux density	0,98		0,98 T	
Air-gap height	3		3 mm	
Voice coil height	3,9	4,5	3,9	4,5 mm
Core diameter	18		18 mm	
Magnet material	ceramic			
diameter	53		53 mm	
mass	0,1		0,1 kg	
Mass of loudspeaker	0,3		0,3 kg	

The loudspeaker has a paper cone and a treated rim. Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering.

Dimensions in mm

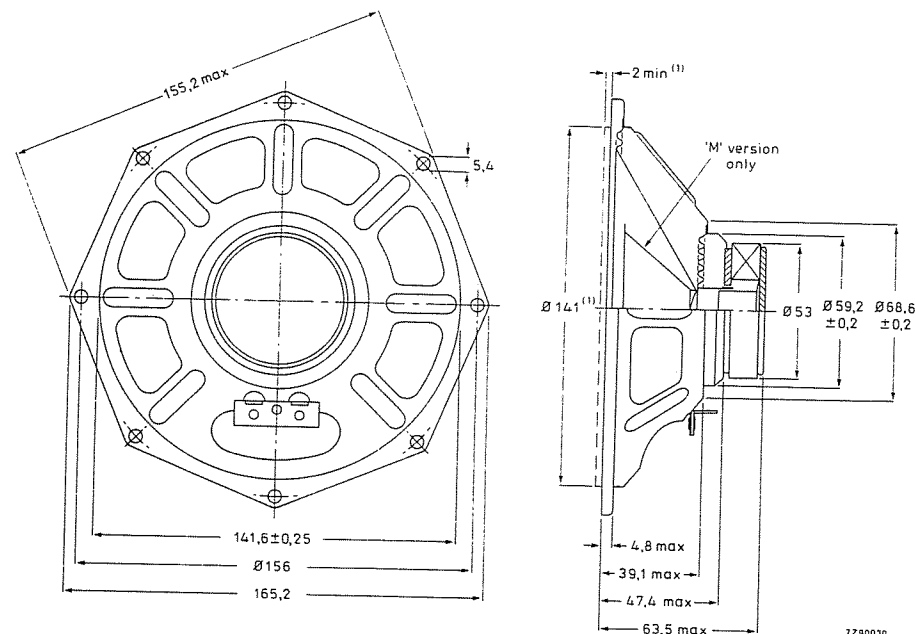


Fig. 1.

(1) Recommended baffle opening ( $\phi$  141 mm) and clearance depth (2 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

## AVAILABLE VERSIONS

AD70800/X4	catalogue number 2422 257 47421
AD70800/X8	catalogue number 2422 257 47422
AD70800/M4	catalogue number 2422 257 47425
AD70800/M8	catalogue number 2422 257 47426

These numbers are for bulk-packed loudspeakers.

## FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

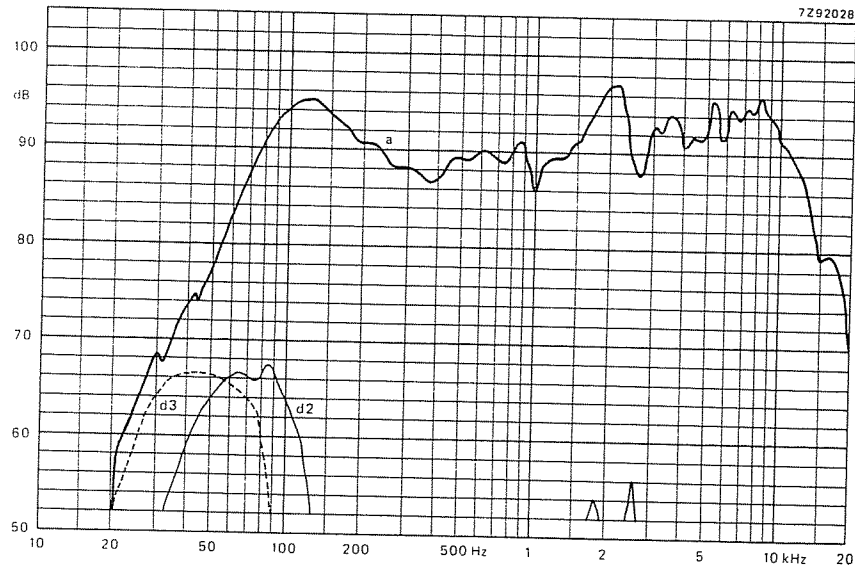


Fig. 2a AD70800/M.

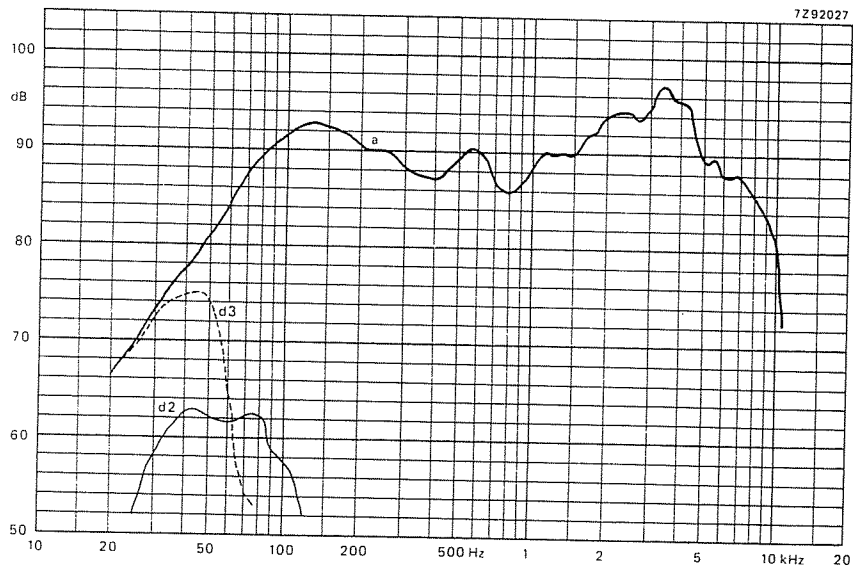


Fig. 2b AD70800/X.

## 7 inch WOOFER LOUDSPEAKER

economic version

- frame: zinc plated steel, yellow
- cone: paper, black
- surround: treated paper

- gaskets: foam, grey
- magnetic compensation: none
- recommended enclosure: 15 l

### TECHNICAL DATA

- Rated impedance
  - Voice coil resistance
  - Rated frequency range
  - Resonance frequency
  - Power handling capacity, measured without filter, loudspeaker unmounted
  - Maximum power on loudspeaker
  - Operating power (sound level 96 dB, 1 m)
  - Sweep voltage (20 to 20 000 Hz)
  - Filter
  - Characteristic sensitivity
  - Energy in air gap
  - Flux density
  - Force factor (BxI) at 1A
  - Piston diameter
  - Piston area
  - Total moving mass
  - Compliance, loudspeaker unmounted
  - Equivalent boxvolume
  - Quality factor, loudspeaker mounted in recommended volume
    - mechanical,  $Q_M$
    - electrical,  $Q_E$
    - total,  $Q_T$
  - Air-gap height
  - Air-gap length
  - Voice coil height
  - Rated coil diameter
  - Magnet material
    - diameter
    - mass
  - Mass of loudspeaker
- Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.

	version	
	W4	W8
Rated impedance	4	8 $\Omega$
Voice coil resistance	3,4	6,9 $\Omega$
Rated frequency range	8000	Hz
Resonance frequency	86	Hz
Power handling capacity, measured without filter, loudspeaker unmounted	20	W
Maximum power on loudspeaker	35	W
Operating power (sound level 96 dB, 1 m)	8	W
Sweep voltage (20 to 20 000 Hz)	3,9	5,5 W
Filter	none	
Characteristic sensitivity	to be fixed	dB
Energy in air gap	53	mJ
Flux density	0,98	T
Force factor (BxI) at 1A	2,63	2,9 Wb/m
Piston diameter	125 x 10 <sup>-3</sup>	m
Piston area	12,3 x 10 <sup>-3</sup>	m <sup>2</sup>
Total moving mass	6,3 x 10 <sup>-3</sup>	kg
Compliance, loudspeaker unmounted	0,6 x 10 <sup>-3</sup>	m/N
Equivalent boxvolume	10,9	l
Quality factor, loudspeaker mounted in recommended volume		
mechanical, $Q_M$	4,2	4,2
electrical, $Q_E$	2,0	3,4
total, $Q_T$	1,35	1,9
Air-gap height	3	mm
Air-gap length	0,845	mm
Voice coil height	6,5	mm
Rated coil diameter	18	mm
Magnet material	ceramic	
diameter	72	mm
mass	0,1	kg
Mass of loudspeaker	0,3	kg

Dimensions in mm

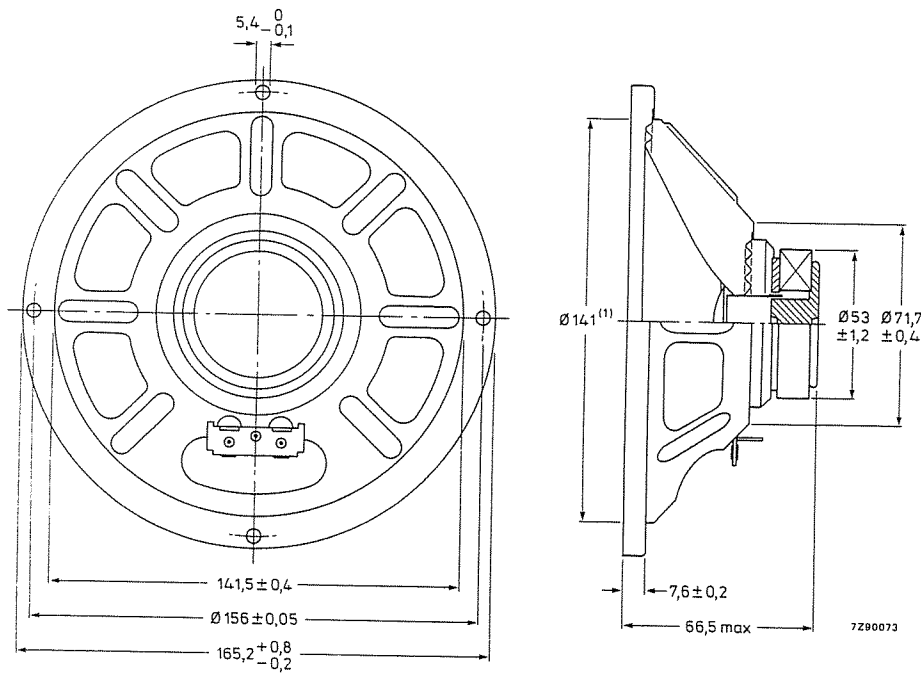


Fig. 1.

→ (1) Recommended baffle hole (141 mm) and mounting clearance (5 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

**AVAILABLE VERSIONS**

AD70804/W4 catalogue number 2422 257 27921 |  
 AD70804/W8 catalogue number 2422 257 27922 | These numbers are for bulk-packed loudspeakers.

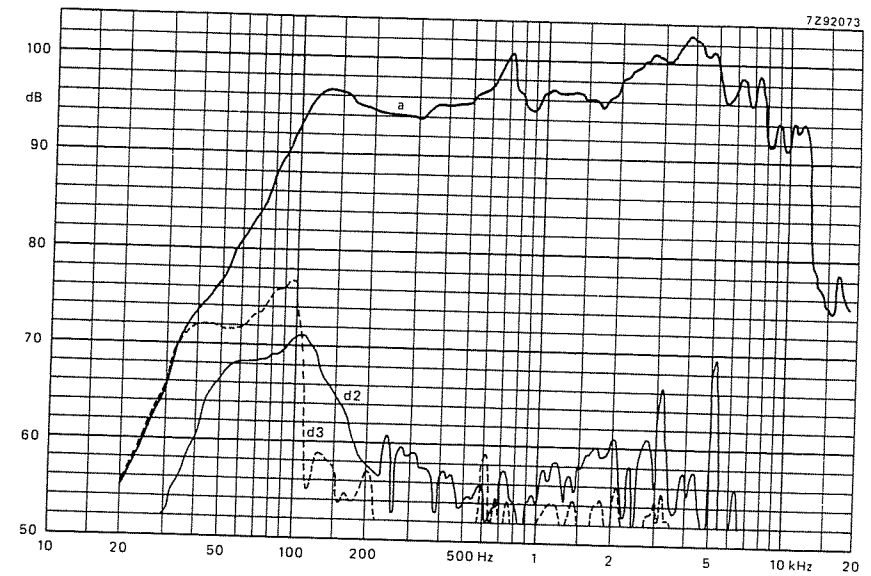


Fig. 2.

**FREQUENCY RESPONSE CURVES** (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.



## 7 inch WOOFER LOUDSPEAKER

- frame: steel, zinc plated, yellow
- cone: paper, black
- surround: textile
- gaskets: foam
- magnetic compensation: none
- recommended enclosure: 15 litre

## TECHNICAL DATA

Rated impedance	8 $\Omega$
Voice coil resistance	6,9 $\Omega$
Rated frequency range	up to 5000 Hz
Resonance frequency	74 Hz
Power handling capacity, measured without filter, loudspeaker unmounted	25 W
Max. power on loudspeaker	40 W
Operating power (sound level 96 dB, 1 m)	8 W
Sweep voltage (20 to 20 000 Hz)	5,5 V
Filter	none
Characteristic sensitivity	87 dB
Energy in air gap	53 mJ
Flux density	0,98 T
Force factor (Bxl) at 1 A	2,9 Wb/m
Piston diameter	0,125 m
Piston area	0,0123 m <sup>2</sup>
Total moving mass	6,3 g
Compliance, loudspeaker unmounted	0,81 x 10 <sup>-3</sup> m/N
Equivalent box volume	15 l
Quality factor, loudspeaker unmounted	
mechanical	3,33
electrical	2,16
total	1,31
Air-gap height	3 mm
Air-gap length	0,845 mm
Voice coil height	6,5 mm
Rated coil diameter	18 mm
Magnet material	ceramic
diameter	53 mm
mass	0,1 kg
Mass of loudspeaker	0,3 kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.

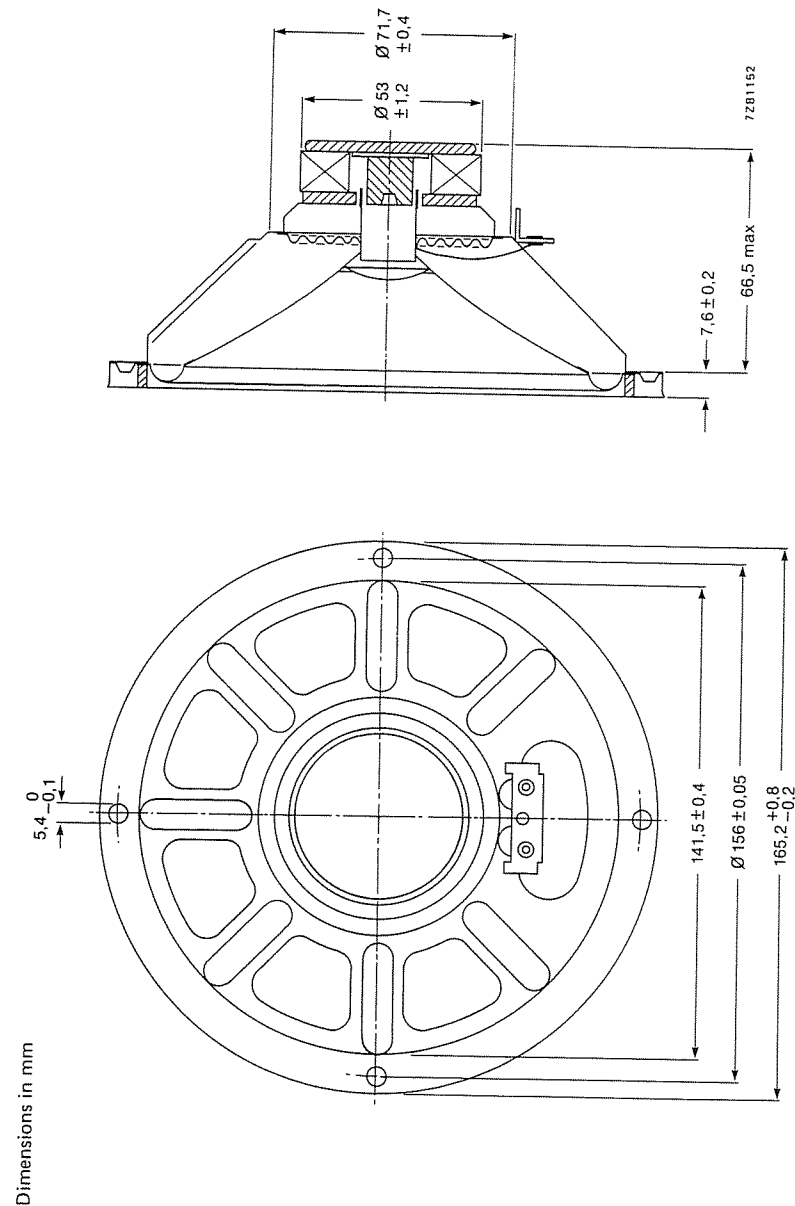


Fig. 1.

Recommended baffle opening ( $\varnothing$  141 mm) and mounting clearance (5 mm) are required for cone movement at the specified power handling capacity. One tag has a mark to facilitate phase matching.

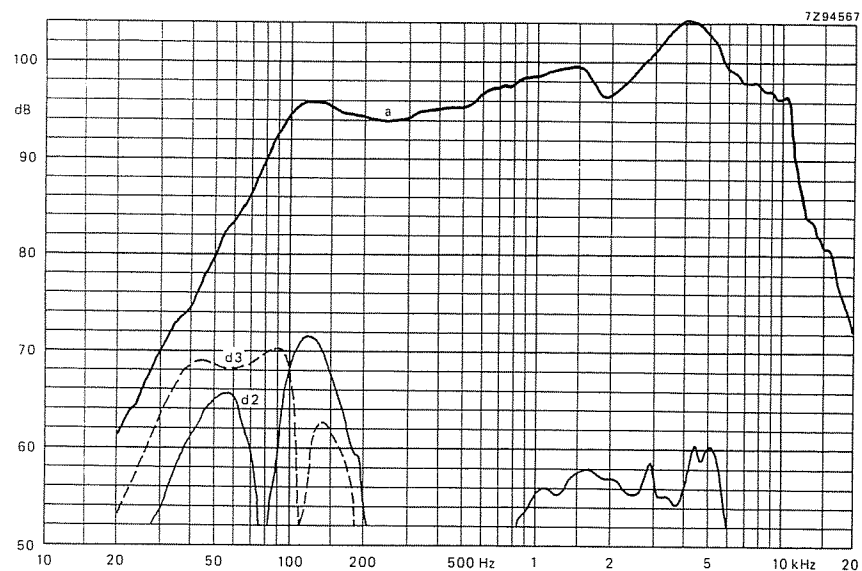


Fig. 2.

**AVAILABLE VERSION**

AD70805/W8. catalogue number 2422 257 27924 This number is for bulk-packed loudspeakers.

**FREQUENCY RESPONSE CURVES** (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure

Curves d2 and d3: 2nd and 3rd harmonic distortion.

**7 inch OCTAGONAL MEDIUM POWER LOUDSPEAKER****APPLICATION**

A full range loudspeaker for all audio applications.

**TECHNICAL DATA**

	version			
	X4	X8	M4	M8
Rated impedance	4	8	4	8 $\Omega$
Voice coil resistance	3,4	7	3,4	7 $\Omega$
Rated frequency range	16 to 15 000		60 to 20 000 Hz	
Resonance frequency	105			Hz
Power handling capacity, measured without filter, loudspeaker unmounted	7			W
Operating power (sound level 90 dB, 1 m)	0,65	0,6	0,75	0,65 W
Sweep voltage (50 to 20 000 Hz)	3,8	5,3	3,8	5,3 V
Energy in air gap	38			mJ
Flux density	1,1			T
Air-gap height	2,5			mm
Voice coil height	4	4,3	4	4,3 mm
Core diameter	14,5			mm
Magnet material diameter	ceramic			
mass	45			mm
Mass of loudspeaker	0,05			kg
	0,217			kg

The loudspeaker has a paper cone. Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering.

Dimensions in mm

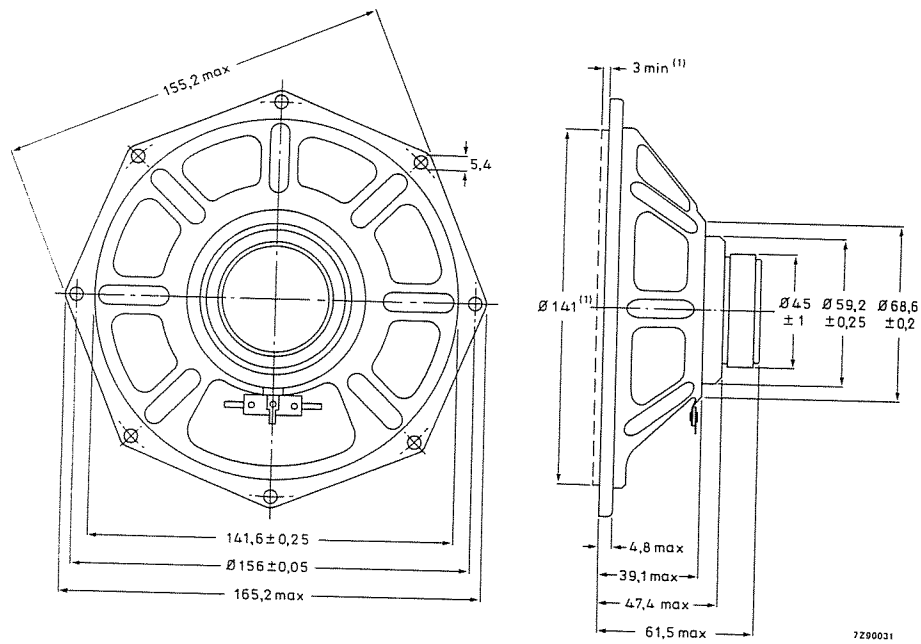


Fig. 1.

(1) Recommended baffle opening ( $\phi$  141 mm) and clearance depth (3 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

**AVAILABLE VERSIONS**

- AD70850/X4 catalogue number 2422 257 47321
- AD70850/X8 catalogue number 2422 257 47322
- AD70850/M4 catalogue number 2422 257 47331
- AD70850/M8 catalogue number 2422 257 47332

These numbers are for bulk-packed loudspeakers.

**FREQUENCY RESPONSE CURVES** (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

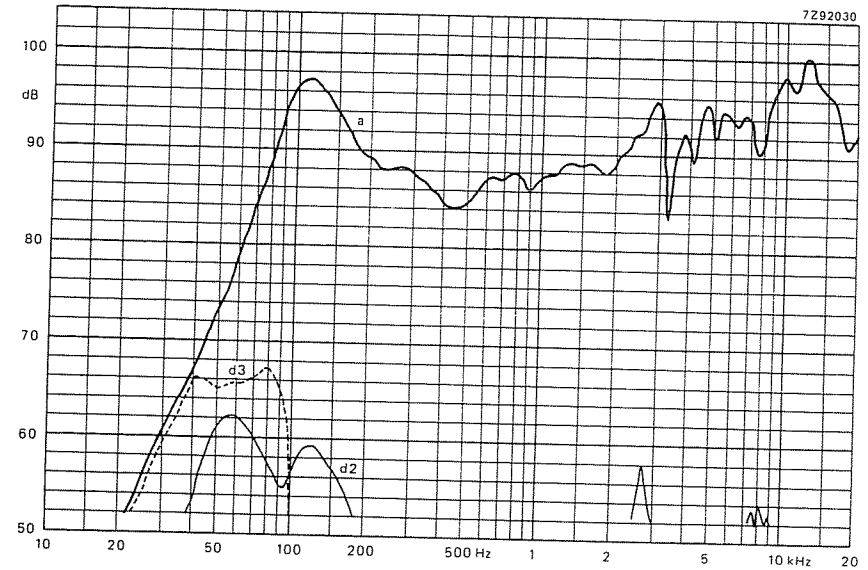


Fig. 2a AD70850/M.

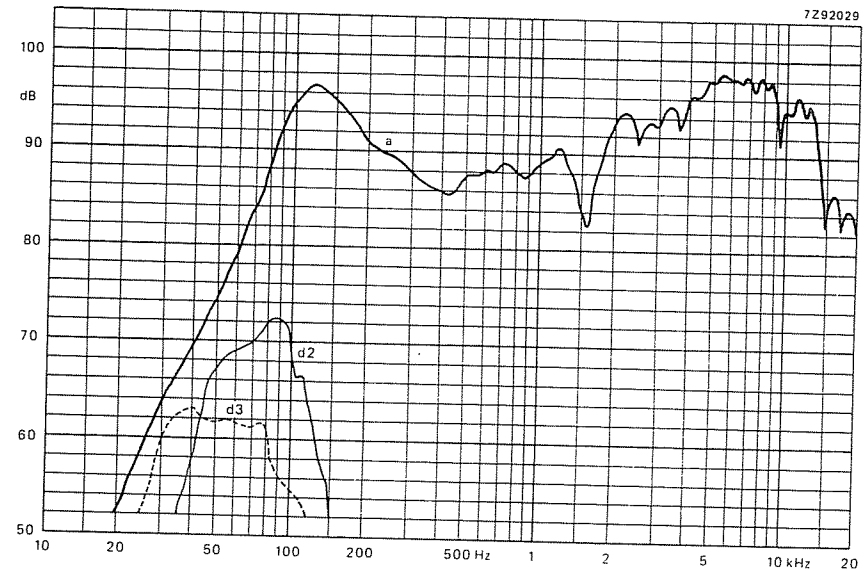


Fig. 2b AD70850/X.

## 7 inch LOW POWER LOUDSPEAKERS

## APPLICATION

Round loudspeaker with 4 mounting lugs for audio and video applications. AD77740 has a screened magnet system.

## TECHNICAL DATA

	version			
	X4	X8	X15	X25
Rated impedance	4	8	15	25 $\Omega$
Voice coil resistance	3,5	7,1	13,7	22,8 $\Omega$
Rated frequency range	70 to 13 000			Hz
Resonance frequency	100			Hz
Power handling capacity, measured without filter, loudspeaker unmounted	5			W
Operating power (sound level 90 dB, 1 m)	400			mW
Sweep voltage (100 to 20 000 Hz)	2,4	3,5	4,7	6,1 V
Filter	none			
Energy in air gap	12,7			mJ
Flux density	0,74			T
Air-gap height	2,5			mm
Voice coil height	2,7	2,2	3,0	3,6 mm
Core diameter	10			mm
Magnet material	ceramic			
square	28,5			mm
mass	18			g
Mass of loudspeaker	106			g

Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering. The loudspeaker has a plastic frame and a paper cone.

Screened and compensated loudspeakers are available on request.

Dimensions in mm

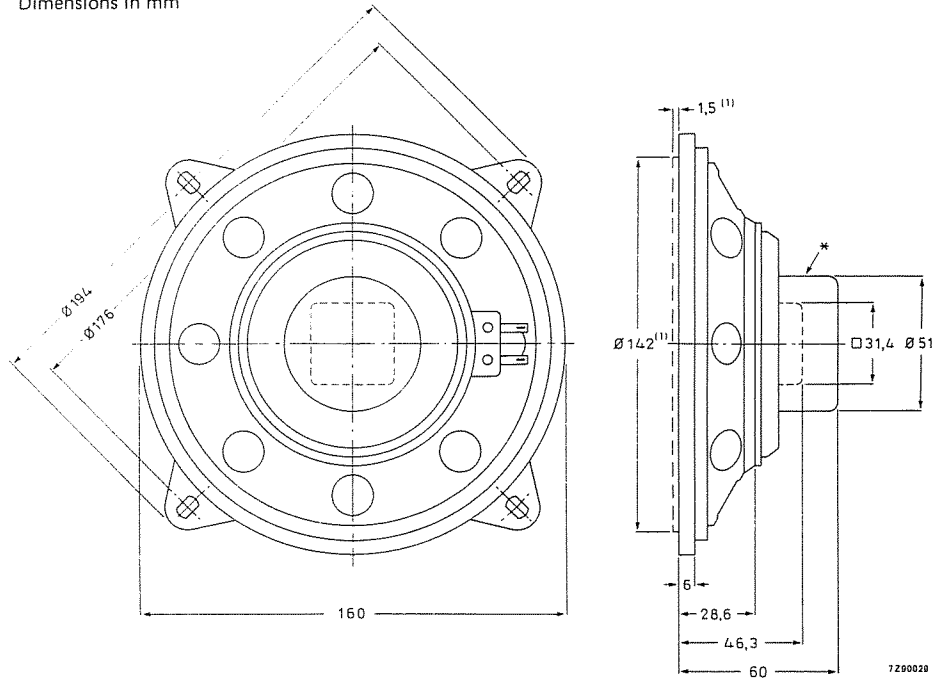


Fig. 1.

(1) Recommended baffle opening ( $\phi$  142 mm) and clearance depth (1,5 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

AVAILABLE VERSIONS

- AD77720/X4 catalogue number 2403 257 27921
- AD77720/X8 catalogue number 2403 257 27922
- AD77720/X15 catalogue number 2403 257 27923
- AD77720/X25 catalogue number 2403 257 27924
- AD77740/X4 catalogue number 2403 257 27821
- AD77740/X8 catalogue number 2403 257 27822
- AD77740/X15 catalogue number 2403 257 27823
- AD77740/X25 catalogue number 2403 257 27824

These numbers are for bulk-packed loudspeakers.

FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

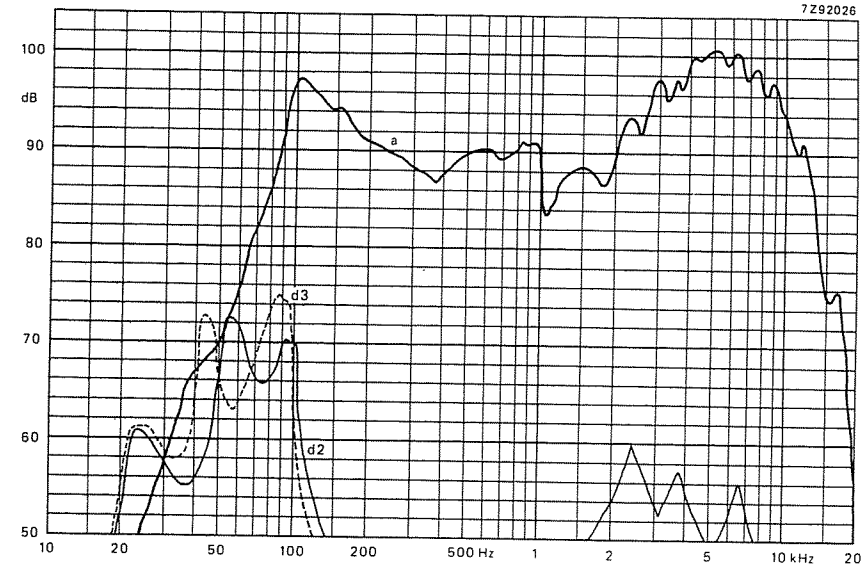


Fig. 2.

## 7 inch LOW POWER LOUDSPEAKERS

### APPLICATION

Round loudspeaker with 4 mounting lugs for audio and video applications. AD77745 has a screened magnet system.

### TECHNICAL DATA

	version			
	X4	X8	X15	X25
Rated impedance	4	8	15	25 $\Omega$
Voice coil resistance	3,5	7,1	13,7	22,8 $\Omega$
Rated frequency range	70 to 13 000			Hz
Resonance frequency	100			Hz
Power handling capacity, measured without filter, loudspeaker unmounted	5			W
Maximum power on loudspeaker	7			W
Operating power (sound level 90 dB, 0,5 m)	400			mW
Sweep voltage (100 to 20 000 Hz)	2,4	3,5	4,7	6,1 V
Filter	none			
Energy in air gap	12,7			mJ
Flux density	0,74			T
Air-gap height	2,5			mm
Voice coil height	2,7	2,2	3,0	3,6 mm
Core diameter	10			mm
Magnet material	ceramic			
square	28,5			mm
mass	18			g
Mass of loudspeaker				
AD77725	100			g
AD77745	120			g

Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering.

The loudspeaker has a plastic frame and a paper cone.

→ Screened and compensated loudspeakers are available on request.

Dimensions in mm

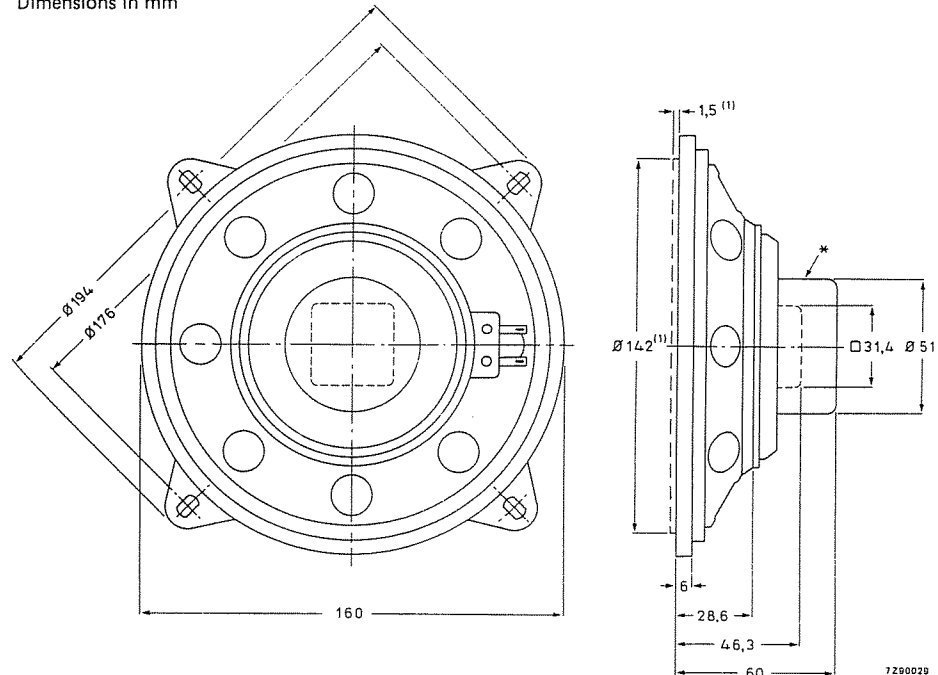


Fig. 1.

\* Screening for AD77745 only.

(1) Recommended baffle opening ( $\phi$  142 mm) and clearance depth (1,5 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

### AVAILABLE VERSIONS

AD77725/X4	catalogue number 2403 257 57921
AD77725/X8	catalogue number 2403 257 57922
AD77725/X15	catalogue number 2403 257 57923
AD77725/X25	catalogue number 2403 257 57924

These numbers are for bulk-packed loudspeakers.

AD77745/X4	catalogue number 2403 257 57821
AD77745/X8	catalogue number 2403 257 57822
AD77745/X15	catalogue number 2403 257 57823
AD77745/X25	catalogue number 2403 257 57824

### FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

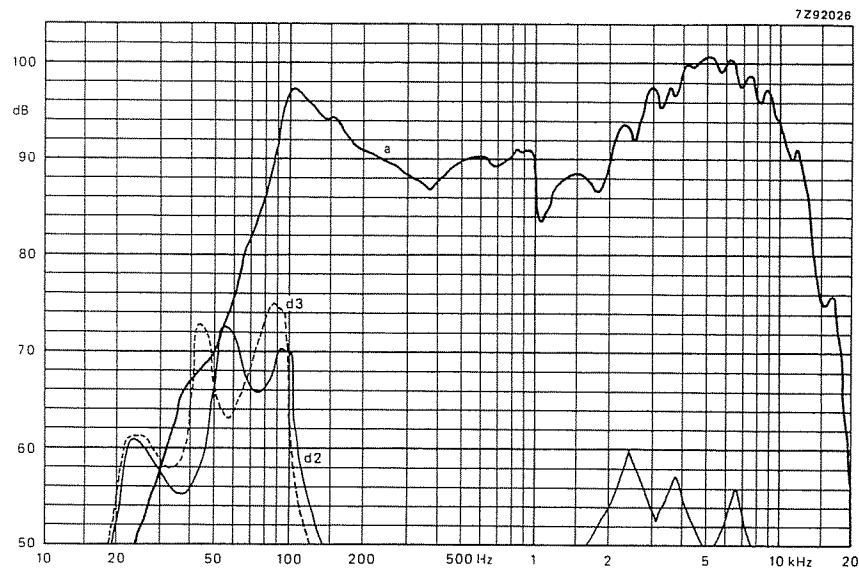


Fig. 2.

## 8 inch HIGH POWER WOOFER LOUDSPEAKER

### TECHNICAL DATA

	version	
	W6	W8
Rated impedance	6	8 $\Omega$
Voice coil resistance	5,1	6 $\Omega$
Rated frequency range	20 to 2000 Hz	
Resonance frequency	40	Hz
Power handling capacity, measured without filter, loudspeaker mounted in 25 l sealed box	60	W
Maximum power on loudspeaker	120	W
Operating power (sound level 96 dB, 1 m)	3,2	W
Sweep voltage (20 to 2000 Hz)	7,5	9 V
Filter	none	
Energy in air gap	435	mJ
Flux density	0,89	T
Force factor (b x l) at 1 A	8,8	9 Wb/m
Total moving mass	15,5	16,5 g
Compliance, loudspeaker unmounted	1,05	1,03 mm/N
Air-gap height	9	mm
Voice coil height	13	16 mm
Core diameter	35	mm
Magnet material	ceramic	
diameter	102	mm
mass	0,58	kg
Mass of loudspeaker	1,8	kg

Connection is by 2,8 mm (0,11 inch) or by 5,1 mm (0,2 inch) tag connectors or by soldering. The loudspeaker has a paper cone and a foam plastic surround.

Dimensions in mm

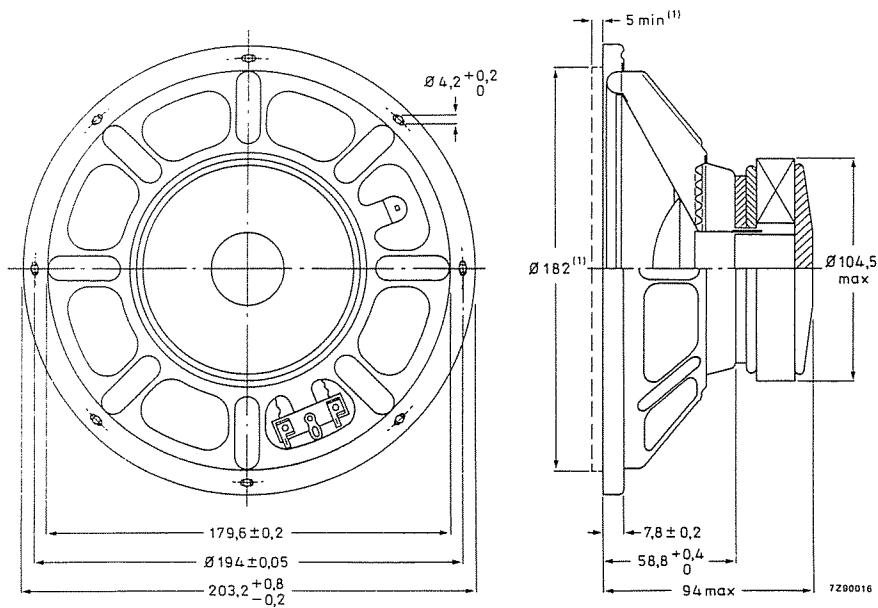


Fig. 1.

(1) Recommended baffle hole ( $\varnothing 182 \text{ mm}$ ) and clearance depth ( $5 \text{ mm}$ ) are required for cone movement at the specified power handling capacity. Recommended box enclosure:  $25 \text{ l}$ . One tag has a red mark to facilitate phase matching.

## AVAILABLE VERSIONS

AD80110/W6 catalogue number 2422 257 48824

AD80110/W8 catalogue number 2422 257 48822

These numbers are for bulk-packed loudspeakers.

## FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted in a sealed  $25 \text{ l}$  enclosure.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

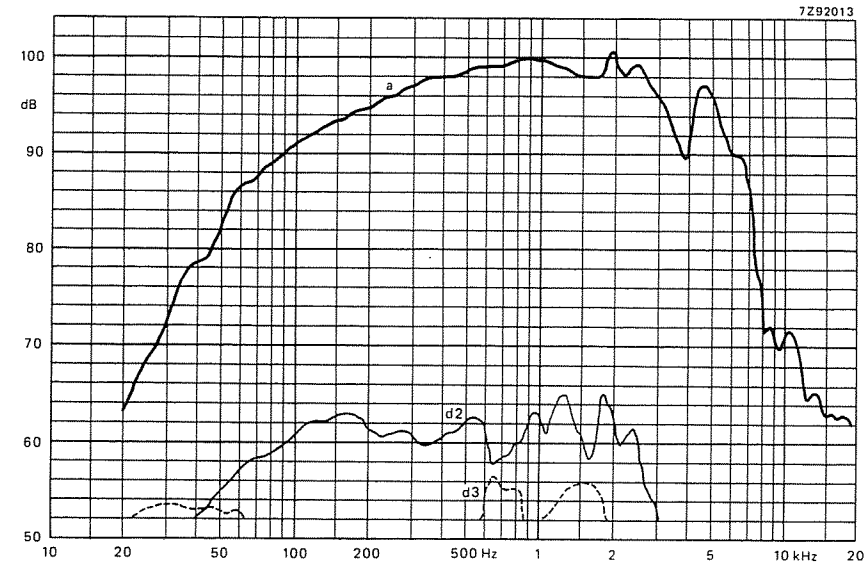


Fig. 2.



## 8 inch WOOFER LOUDSPEAKER

with smooth roll-off

- frame: octagonal, zinc plated, yellow
- cone: paper black
- surround: textile
- gaskets: none
- magnetical compensation: none
- recommended enclosure: 25 l

## TECHNICAL DATA

Rated impedance	8 $\Omega$
Voice coil resistance	13,3 $\Omega$
Rated frequency range	60 to 8000 Hz
Resonance frequency	50 Hz
Power handling capacity (1 min. on, 2 min. out: 300 h)	30 W
Maximum power on loudspeaker	60 W
Operating power (sound level 96 dB, 1 m)	5 W
Sweep voltage (20 to 20 000 Hz)	55 V
Filter	none
Characteristic sensitivity	1 dB
Energy in air gap	80,3 mJ
Flux density	0,85 T
Force factor (B x l) at 1 A	4,5 Wb/m
Piston diameter	160 x 10 <sup>-3</sup> m
Piston area	20 x 10 <sup>-3</sup> m <sup>2</sup>
Total moving mass	10,45 x 10 <sup>-3</sup> kg
Compliance, loudspeaker unmounted	1,095 x 10 <sup>-3</sup> m/N
Equivalent box volume	52,25 l
Quality factor, loudspeaker unmounted	
Q mechanical	4,9
Q electrical	1,20
Q total	0,96
Air-gap height	3 mm
Air-gap length	1,525 mm
Voice coil height	6,5 mm
Coil diameter	18 mm
Magnet material	ceramic
diameter	60 mm
mass	0,15 kg
Mass of loudspeaker	0,47 kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.

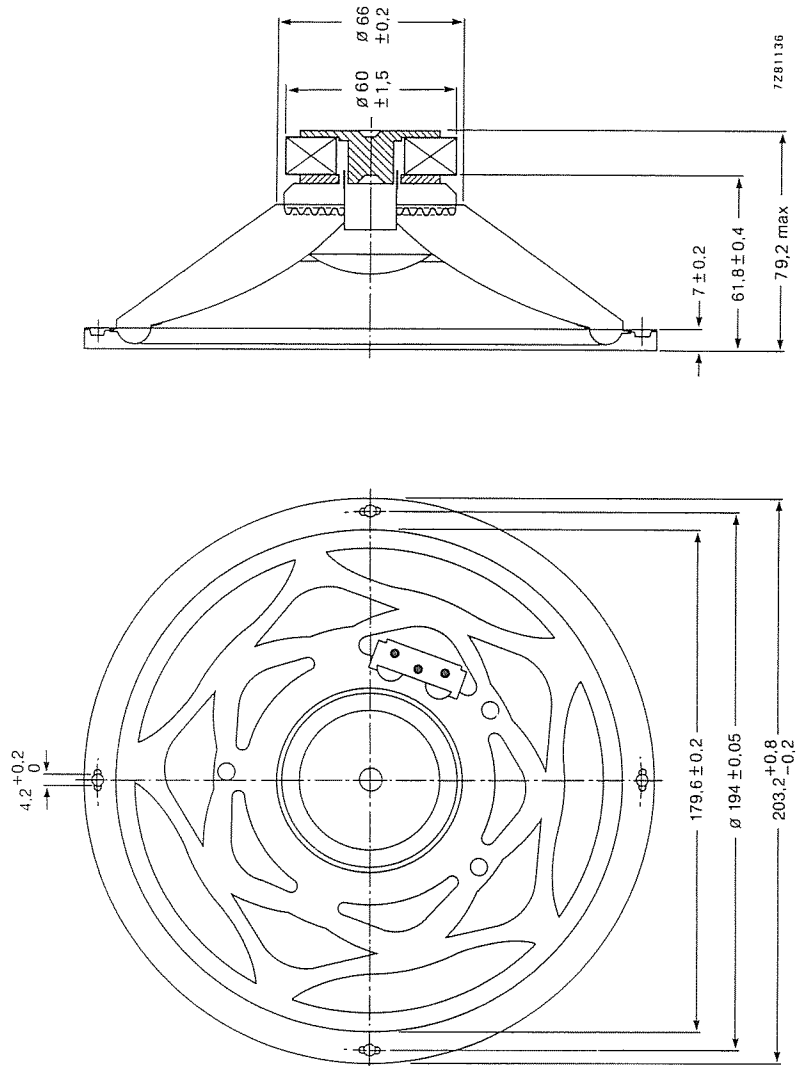


Fig. 1. Recommended baffle opening ( $\varnothing 182 \text{ mm}$ ) and mounting clearance ( $5 \text{ mm}$ ) are required for cone movement at the specified power handling capacity. One tag (+ side) has a red mark to facilitate phase matching.

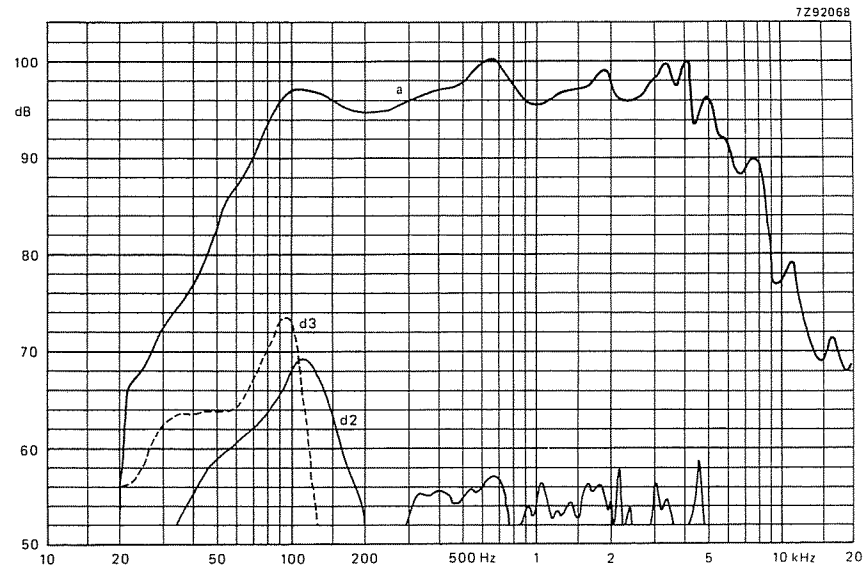


Fig. 2.

**AVAILABLE VERSION**

AD80400/W8 catalogue number 2422 257 28224. This number is for bulk-packed loudspeakers.

**FREQUENCY RESPONSE CURVES** (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

## 8 inch HIGH POWER WOOFER LOUDSPEAKER

## APPLICATION

For hi-fi enclosures, recommended box volume 25 l.

## TECHNICAL DATA

Rated impedance	8 $\Omega$
Voice coil resistance	6,8 $\Omega$
Rated frequency range	45 to 7000 Hz
Resonance frequency	50 Hz
Power handling capacity, measured without filter, loudspeaker unmounted	35 W
Maximum power on loudspeaker	70 W
Operating power (sound level 96 dB, 1 m)	7 W
Sweep voltage (20 to 4000 Hz)	7,5 V
Filter	none
Energy in air gap	81,7 mJ
Flux density	0,55 T
Force factor (b x l) at 1 A	4,2 Wb/m
Total moving mass, loudspeaker mounted	13,4 g
Compliance, loudspeaker unmounted	0,83 mm/N
Air-gap height	5 mm
Voice coil height	7 mm
Coil diameter	25 mm
Magnet material	ceramic
diameter	60 mm
mass	100 g
Mass of loudspeaker	680 g

Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering. The loudspeaker has a paper cone and a foam rim.

Dimensions in mm

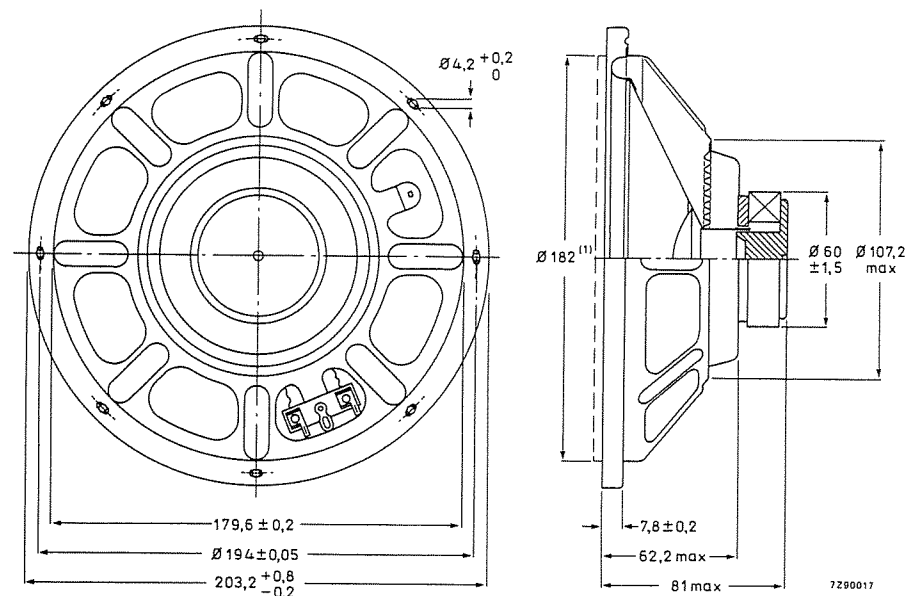


Fig. 1.

(1) Recommended baffle hole ( $\phi$  182 mm) and clearance depth (5 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

## AVAILABLE VERSION

AD80405/W8 catalogue number 2422 257 28122. This number is for bulk-packed loudspeakers.

## FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

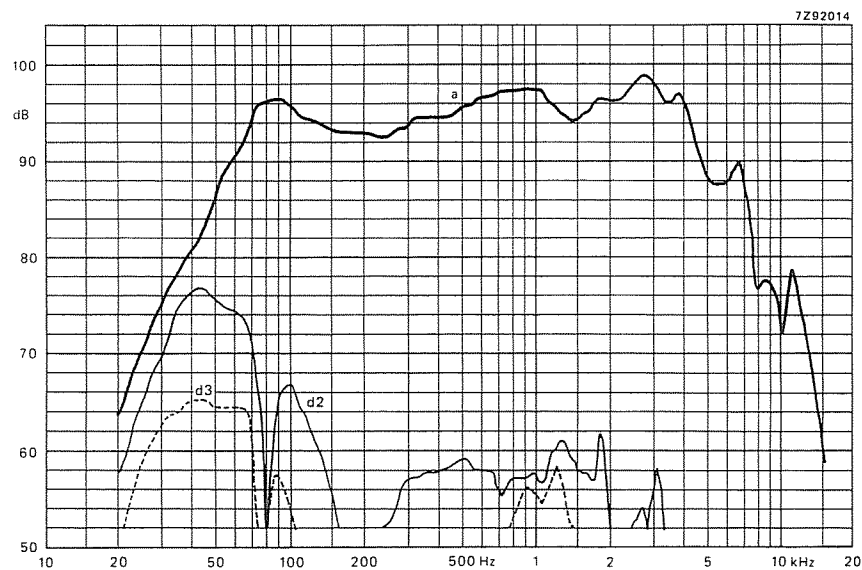


Fig. 2.

## 8 inch HIGH POWER WOOFER LOUDSPEAKERS

## APPLICATION

For high-fidelity reproduction in sealed acoustic enclosures. Maximum enclosure volume 25 litres. Maximum recommended crossover frequency 2000 Hz.

## TECHNICAL DATA

	version	
	W4	W8
Rated impedance	4	8 $\Omega$
Voice coil resistance	3,6	7 $\Omega$
Rated frequency range	50 to 2000 Hz	
Resonance frequency	42	Hz
Power handling capacity, measured without filter, mounted in 25 l sealed enclosure	50	W
Maximum power on loudspeaker	100	W
Operating power	5	W
Sweep voltage (frequency range 35 to 3000 Hz)	5	6,3 V
Maximum excursion voltage at 20 Hz	7	V
Characteristic sensitivity	to be established *	
Energy in air gap	135	mJ
Flux density	0,87	T
Force factor (B x l) at 1 A	4	5,5 Wb/m
Total moving mass	14	g
Compliance, loudspeaker unmounted	1,12	mm/N
Air-gap height	5	mm
Voice coil height	10	mm
Core diameter	25	mm
Magnet material	ceramic	
diameter	72	mm
mass	0,26	kg
Mass of loudspeaker	0,8	kg

The loudspeaker has a polyester surround. Connection to the loudspeaker by means of 5,1 mm (0,2 inch) or 2,8 mm (0,11 inch) tag connectors or by soldering.

Dimensions in mm

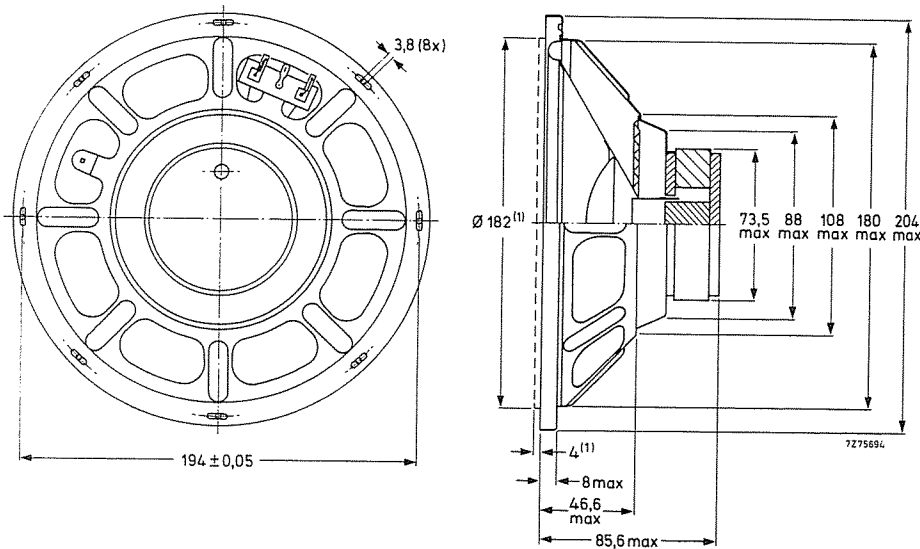


Fig. 1.

(1) Baffle hole and clearance depth required for cone movement at the specified power handling capacity.

One tag is indicated by a red mark for in-phase connection.

AVAILABLE VERSIONS

AD80602/W4, catalogue number 2422 257 48331 } these numbers apply to bulk  
 AD80602/W8, catalogue number 2422 257 48332 } packed loudspeakers, minimum  
 packing quantity 12 per unit.

FREQUENCY RESPONSE CURVES (See Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker mounted in sealed 25 l enclosure, filled with 1 kg of glasswool.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

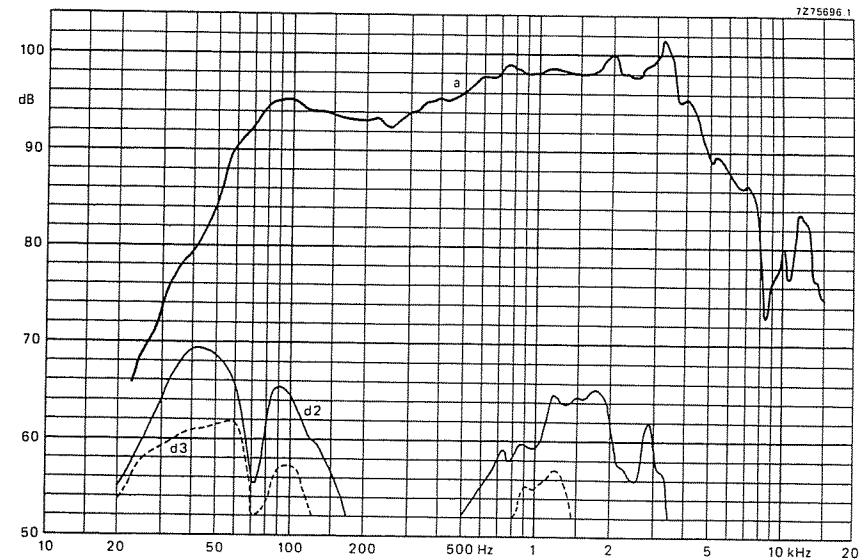


Fig. 2.

## 8 inch HIGH POWER WOOFER LOUDSPEAKER

## APPLICATION

For bass reproduction in high economy enclosures. Recommended volume enclosure 25 litres. The loudspeaker has a smooth roll-off allowing a 6 dB per octave filter.

## TECHNICAL DATA

Rated impedance	6 $\Omega$
Voice coil resistance	4,9 $\Omega$
Rated frequency range	60 to 4000 Hz
Resonance frequency	50 Hz
Power handling capacity, mounted in 25 l sealed enclosure, measured without filter	40 W
Maximum power on loudspeaker	60 W
Operating power	4 W
Sweep voltage, frequency range: 35 to 4000 Hz	6 V
Quality factor	
mechanical	6,2
electrical	1,5
total	1,2
Characteristic sensitivity	to be established
Energy in air gap	166 mJ
Flux density	0,66 T
Force factor (B x l) at 1 A	4,6 Wb/m
Total moving mass	13,4 g
Compliance, loudspeaker unmounted	0,83 mm/N
Air-gap length	1,6 mm
Air-gap height	5 mm
Voice coil height	6,5 mm
Core diameter	25 mm
Magnet material	ceramic
diameter	72 mm
mass	0,16 kg
Mass of loudspeaker	0,65 kg

The loudspeaker has a paper cone and a foam rubber surround. Connection to the loudspeaker by means of 5,1 mm (0,2 inch) or 2,8 mm (0,11 inch) tag connectors or by soldering.

Dimensions in mm

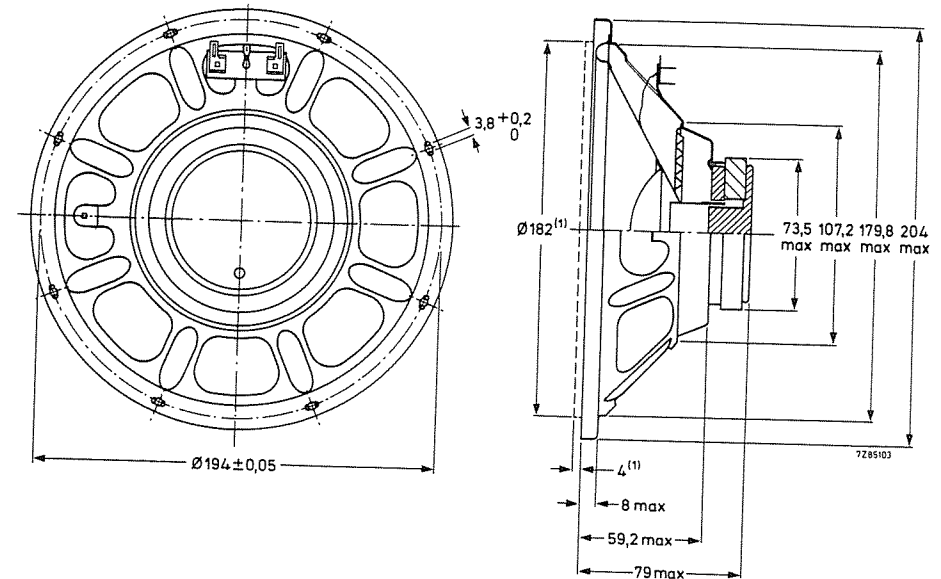


Fig. 1.

(1) Baffle hole and clearance depth required for cone movement at the specified power handling capacity.

One tag is indicated by a red mark for in-phase connection.

## AVAILABLE VERSION

AD80605/W6, catalogue number 2422 257 48325 | this number applies to bulk packed loudspeakers, minimum packing quantity 12 per unit.

## FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in half free field at the operating power. Loudspeaker mounted in sealed 25 l enclosure.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

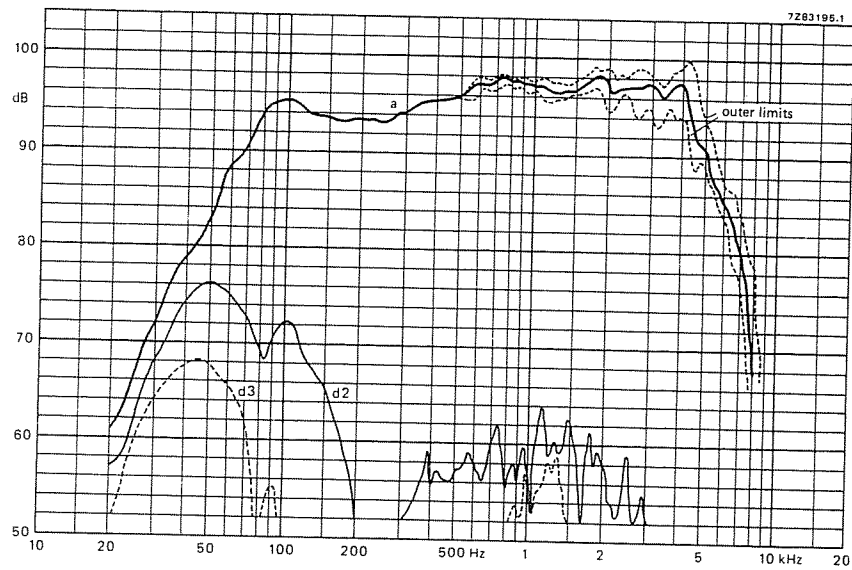


Fig. 2.

## 8 inch HIGH POWER WOOFER LOUDSPEAKER

- frame: steel, zinc plated, yellow
- cone: paper, black
- surround: foam

## TECHNICAL DATA

	version		
	W4	W6	W8
Rated impedance	4	6	8 $\Omega$
Voice coil resistance	3,4	4,6	6,3 $\Omega$
Resonance frequency	36	40	38 Hz
Power handling capacity, measured without filter, loudspeaker unmounted		50	W
Maximum power on loudspeaker		100	W
Operating power (sound level 96 dB, 1 m)		6	W
Sweep voltage (35 to 3500 Hz)	4	4,8	5,5 V
Filter		none	
Excursion voltage at 20 Hz	6		8,5 V
Energy in air gap		134	mJ
Flux density		0,64	T
Force factor ( $b \times l$ ) at 1 A	4,9	6	6 Wb/m
Total moving mass	18	18,9	16 g
Compliance, loudspeaker unmounted	1,16	0,93	1,18 mm/W
Air-gap length		1,9	mm
Air-gap height		5	mm
Voice coil height		12	mm
Coil diameter		25	mm
Magnet material		ceramic	
diameter		72	mm
mass		0,26	kg
Mass of loudspeaker		0,81	kg
Recommended box volume		25	l

A second connecting plate permits support of a filter capacitor.

Connection is by 5,1 mm (0,2 inch) or 2,8 mm (0,11 inch) tag connectors or by soldering. The loudspeaker has a paper cone and a foam plastic surround.

Dimensions in mm

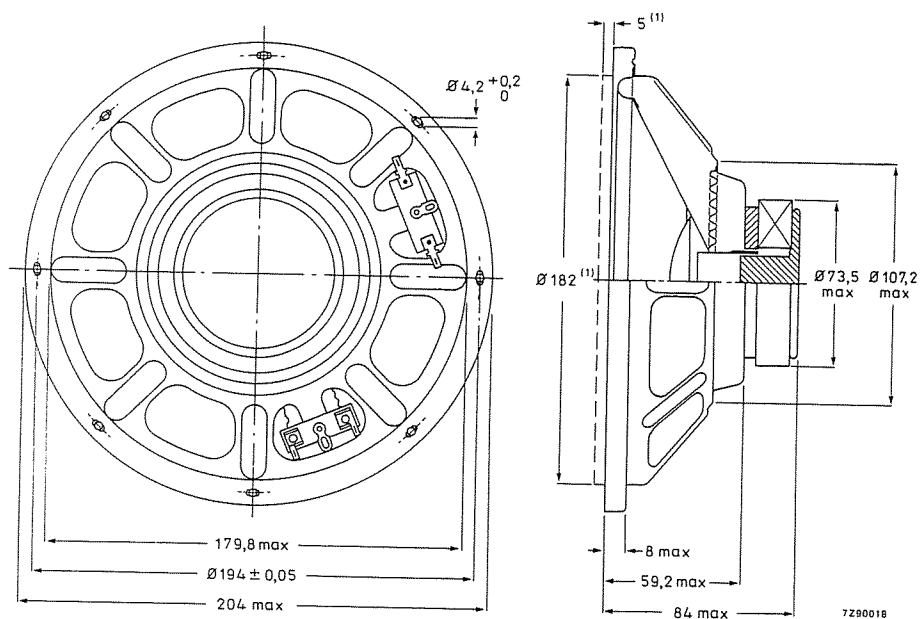


Fig. 1.

(1) Recommended baffle hole ( $\phi$  182 mm) and clearance depth (5 mm) are required for cone movement at the specified power handling capacity. Recommended box enclosure: 25 l. One tag has a red mark to facilitate phase matching.

#### AVAILABLE VERSIONS

AD80806/W4	catalogue number 2422 257 48231	These numbers are for bulk-packed loudspeakers, minimum packing quantity 8 per unit.
AD80606/W6	catalogue number 2422 257 48238	
AD80606/W8	catalogue number 2422 257 48232	

#### FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker mounted in 25 l enclosure.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

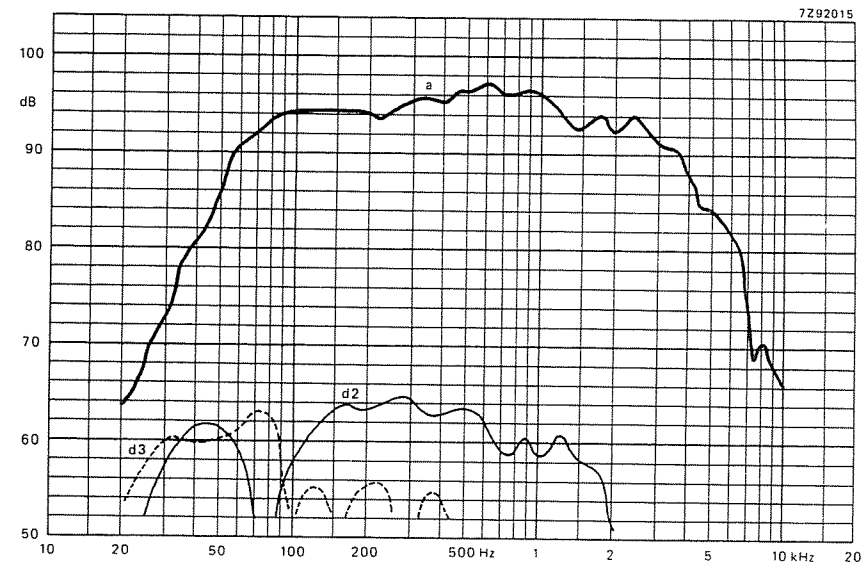


Fig. 2.



## 8 inch HIGH POWER WOOFER LOUDSPEAKER

- frame: steel, zinc plated, yellow
- cone: paper, black
- surround: foam
- gaskets: none
- magnetic compensation: none
- recommended enclosure: 26 l

## TECHNICAL DATA

Rated impedance	6 $\Omega$
Voice coil resistance	5 $\Omega$
Rated frequency range	50 to 4 000 Hz
Sensitivity	t.b.f. dB
Resonance frequency	43 Hz
Cross-over frequency (6 dB/octave slope)	2000 Hz
Power handling capacity, measured without filter, loudspeaker unmounted	50 W
Max. power on loudspeaker	t.b.f. W
Sweep voltage (20 to 20 000 Hz)	7,5 V
Filter	none
Energy in air gap	166 mJ
Flux density	0,66 T
Force factor (Bxl) at 1A	5,8 Wb/m
Piston diameter	0,16 m
Piston area	0,02 m <sup>2</sup>
Total moving mass	14,4 x 10 <sup>-3</sup> kg
Compliance, loudspeaker unmounted	1,04 x 10 <sup>-3</sup> m/N
Equivalent box volume	49,9 l
Quality factor, loudspeaker mounted in recommended volume	
mechanical	4,59
electrical	1
total	0,82
Air-gap height	5 mm
Air-gap length	1,6 mm
Voice coil height	7 mm
Rated coil diameter	25 mm
Magnet material	ceramic
diameter	72 mm
mass	0,26 kg
Mass of loudspeaker	0,765 kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.

Dimensions in mm

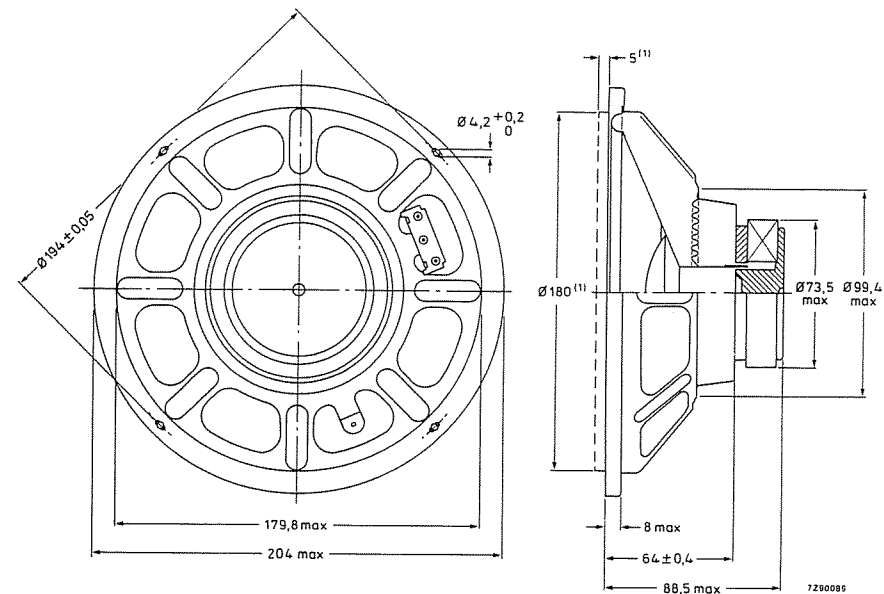


Fig. 1.

- (1) Recommended baffle opening ( $\phi$  180 mm) and mounting clearance (5 mm) are required for cone movement at the specified power handling capacity.  
One tag has a red mark to facilitate phase matching.

## AVAILABLE VERSION

AD80609/W6. catalogue number 2422 257 48334 This number is for bulk-packed loudspeakers.

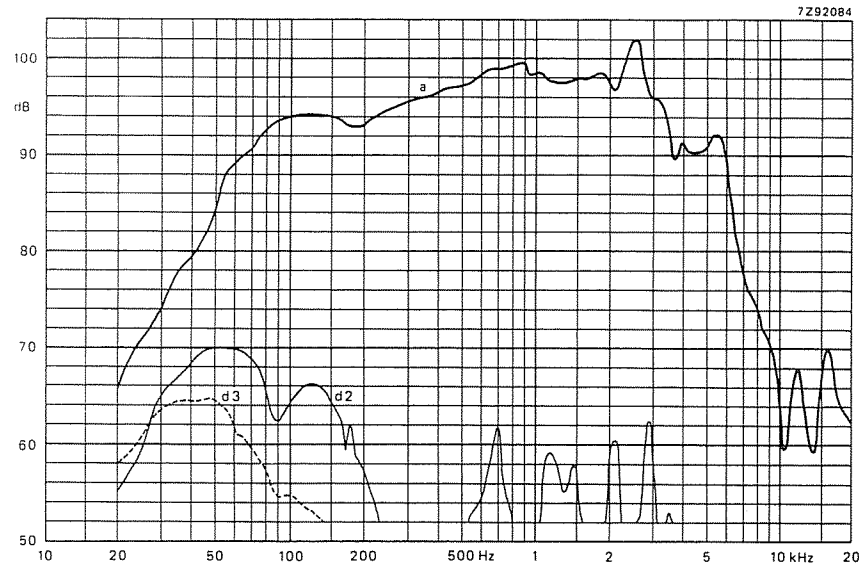


Fig. 2.

### FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

## 8 inch WOOFER LOUDSPEAKER

- frame: steel, zinc plated, yellow
- cone: paper, black
- surround: textile

### TECHNICAL DATA

Rated impedance	8 $\Omega$
Voice coil resistance	7,2 $\Omega$
Rated frequency range	up to 5000 Hz
Resonance frequency	47 Hz
Power handling capacity, measured without filter, loudspeaker unmounted, continuous 100 h	50 W
Max. power on loudspeaker	100 W
Operating power (sound level 96 dB, 1 m)	4 W
Sweep voltage (20 to 5000 Hz)	6,3 V
Filter	none
Characteristic sensitivity	89,5 dB
Energy in air gap	140 mJ
Flux density	0,93 T
Force factor (Bxl) at 1A	5 Wb/m
Piston diameter	m
Piston area	200 cm <sup>2</sup>
Total moving mass	12,3 g
Compliance, loudspeaker unmounted	1,03 x 10 <sup>-3</sup> m/N
Equivalent box volume	49,44 l
Quality factor, loudspeaker unmounted	
mechanical	3,36
electrical	1,08
total	0,82
Air-gap height	5 mm
Air-gap length	1 mm
Voice coil height	11 mm
Rated coil diameter	25 mm
Magnet material	ceramic
diameter	72 mm
mass	0,260 kg
Mass of loudspeaker	0,75 kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.

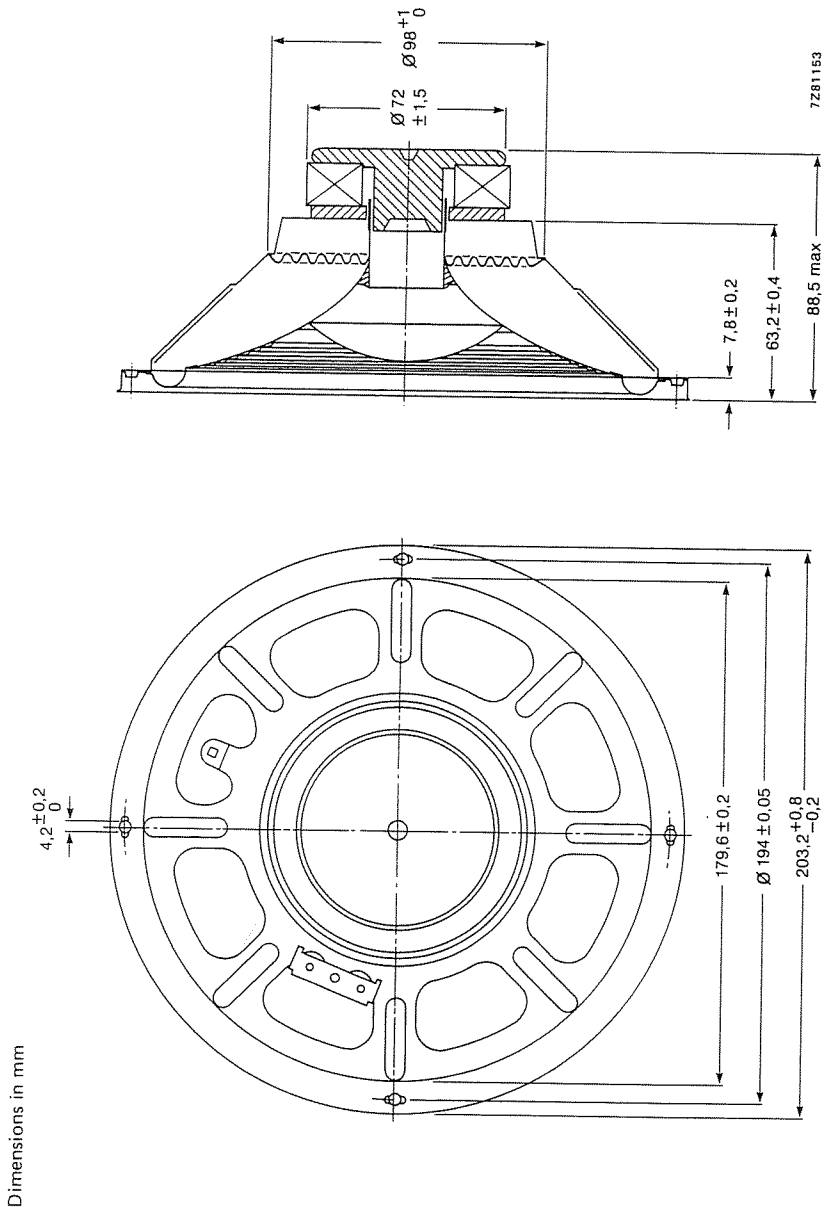


Fig. 1.

Recommended baffle opening ( $\phi$  182 mm) and mounting clearance (5 mm) are required for cone movement at the specified power handling capacity. One tag has a mark to facilitate phase matching.

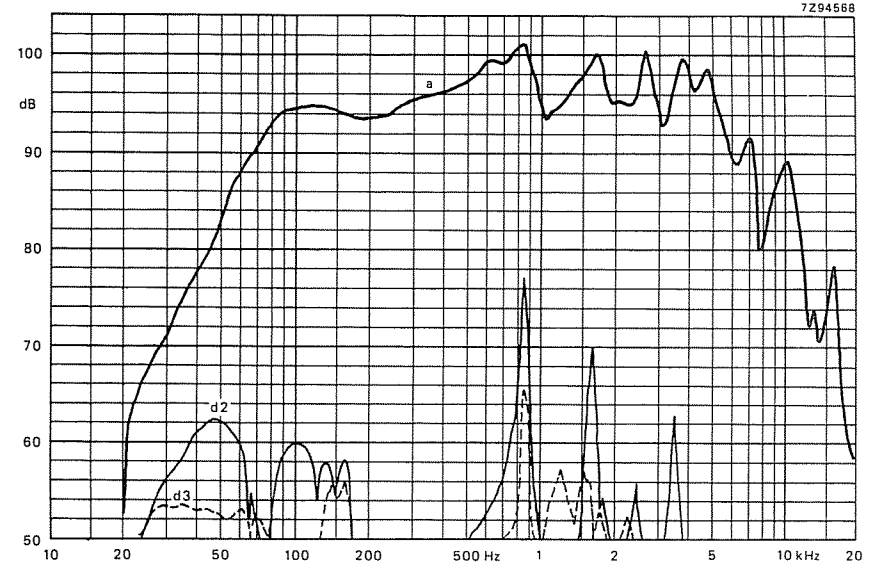


Fig. 2.

**AVAILABLE VERSION**

AD80612/W8 catalogue number 2422 257 48338 This number is for bulk-packed loudspeakers.

**FREQUENCY RESPONSE CURVES** (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure

Curves d2 and d3: 2nd and 3rd harmonic distortion.

## 8 inch HIGH POWER WOOFER LOUDSPEAKER

## APPLICATION

For high-fidelity reproduction in sealed acoustic enclosures. Maximum enclosure volume 25 litres. Maximum recommended crossover frequency 2500 Hz.

## TECHNICAL DATA

	version	
	W4	W8
Rated impedance	4	8 $\Omega$
Voice coil resistance	3,8	7 $\Omega$
Rated frequency range	50 to 4000 Hz	
Resonance frequency	39 Hz	
Power handling capacity, measured without filter, mounted in 25 l sealed enclosure	50	W
Maximum power on loudspeaker	100	W
Operating power	3,8	W
Sweep voltage (frequency range 35 to 3000 Hz)	5	6,3 V
Energy in air gap	229	240 mJ
Flux density	1,1	1,2 T
Force factor (B x l) at 1 A	5,4	6,5 Wb/m
Total moving mass	17,5	g
Compliance, loudspeaker unmounted	1,02	mm/N
Air-gap height	5	mm
Voice coil height	10	mm
Core diameter	25	mm
Magnet material	ceramic	
diameter	90	mm
mass	0,45	kg
Mass of loudspeaker	1,15	kg

The loudspeaker has a paper cone and a polyester surround. Connection to the loudspeaker by means of 5,1 mm (0,2 inch) or 2,8 mm (0,11 inch) tag connectors or by soldering.

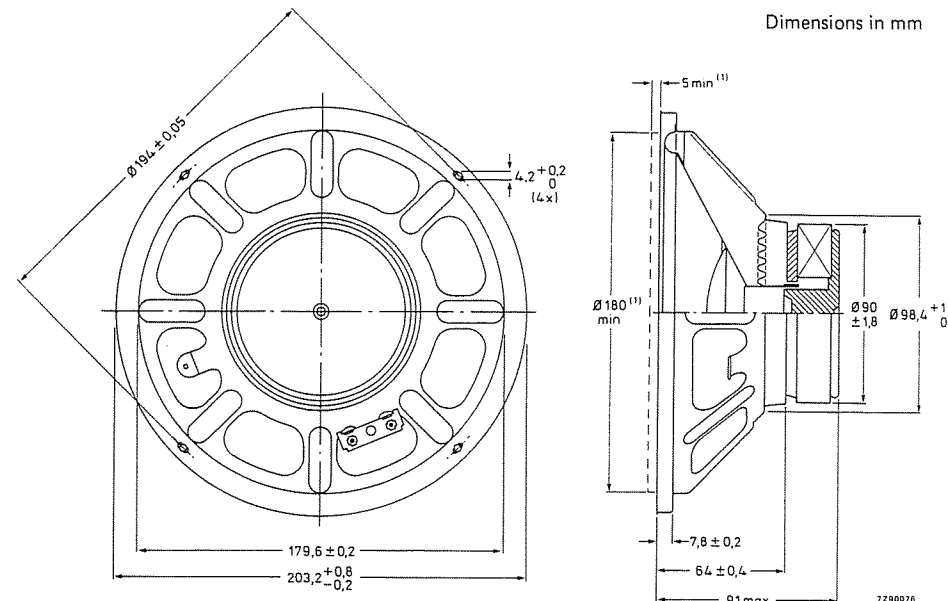


Fig. 1.

(1) Baffle hole and clearance depth required for cone movement at the specified power handling capacity.

One tag is indicated by a red mark for in-phase connection.

## AVAILABLE VERSIONS

AD80652/W4, catalogue number 2422 257 48531  
AD80652/W8, catalogue number 2422 257 48532

these numbers apply to bulk packed loudspeakers, minimum packing quantity 10 per unit.

## FREQUENCY RESPONSE CURVES (See Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker mounted in sealed 25 l enclosure, filled with 1 kg of glasswool.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

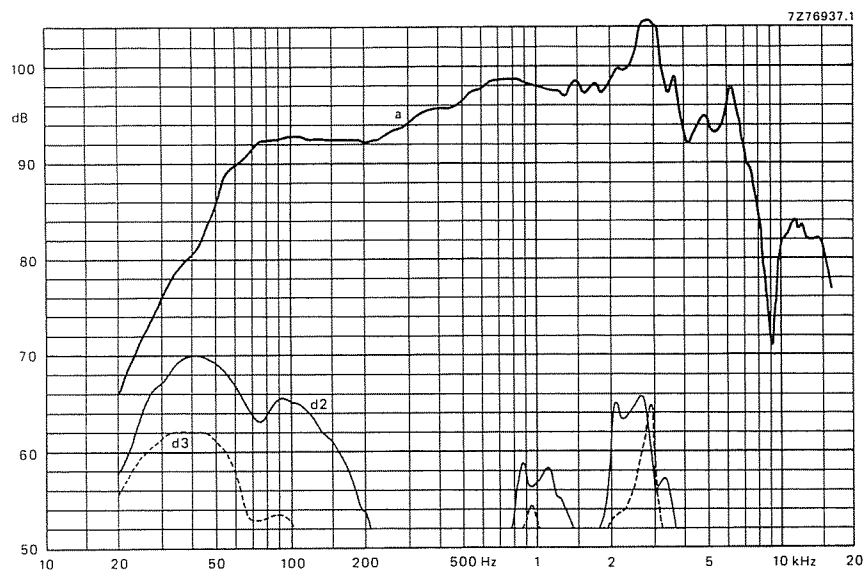


Fig. 2.

## 8 inch HIGH POWER WOOFER LOUDSPEAKER

### APPLICATION

For hi-fi enclosures, recommended box volume 25 l.

### TECHNICAL DATA

Rated impedance	8 $\Omega$
Voice coil resistance	6 $\Omega$
Rated frequency range	50 to 7000 Hz
Resonance frequency	35 Hz
Power handling capacity, measured without filter, loudspeaker unmounted	55 W
Maximum power on loudspeaker	110 W
Operating power (sound level 96 dB, 1 m)	4 W
Sweep voltage (20 to 3500 Hz)	8,5 V
Filter	none
Energy in air gap	249 mJ
Flux density	0,99 T
Force factor (b x l) at 1 A	6,7 Wb/m
Total moving mass, loudspeaker mounted	18,5 g
Compliance, loudspeaker unmounted	1,19 mm/N
Air-gap height	5 mm
Voice coil height	16 mm
Coil diameter	35 mm
Magnet material	ceramic
diameter	90 mm
mass	0,51 kg
Mass of loudspeaker	1,35 kg

Connection is by 2,8 mm (0,11 inch) tag connectors or by soldering. The loudspeaker has a paper cone and a foam rim.

Dimensions in mm

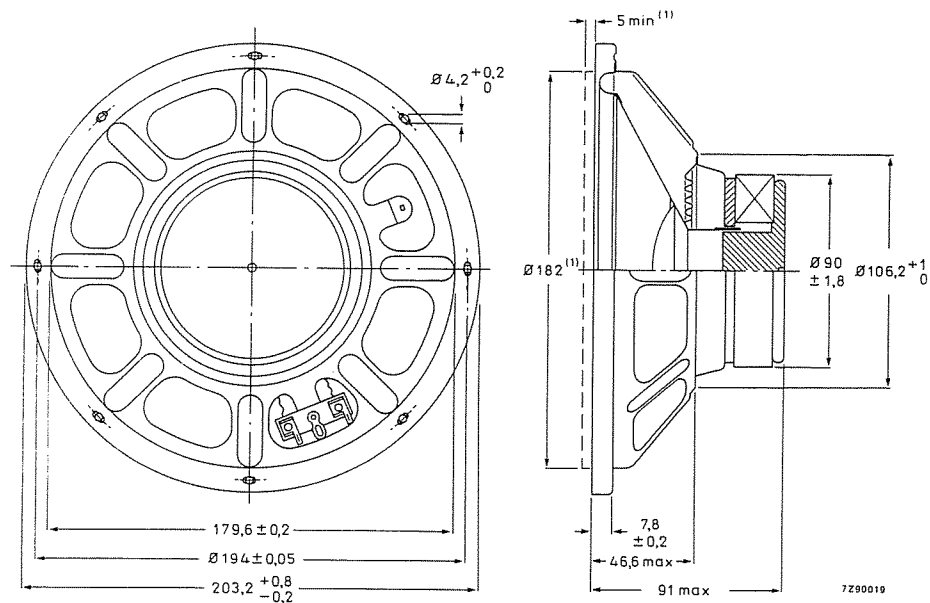


Fig. 1.

(1) Recommended baffle hole ( $\phi 182$  mm) and clearance depth (5 mm) are required for cone movement at the specified power handling capacity. Recommended box enclosure: 25 l. One tag has a red mark to facilitate phase matching.

## AVAILABLE VERSION

AD80680/W8 catalogue number 2422 257 48922. This number is for bulk-packed loudspeakers.

## FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

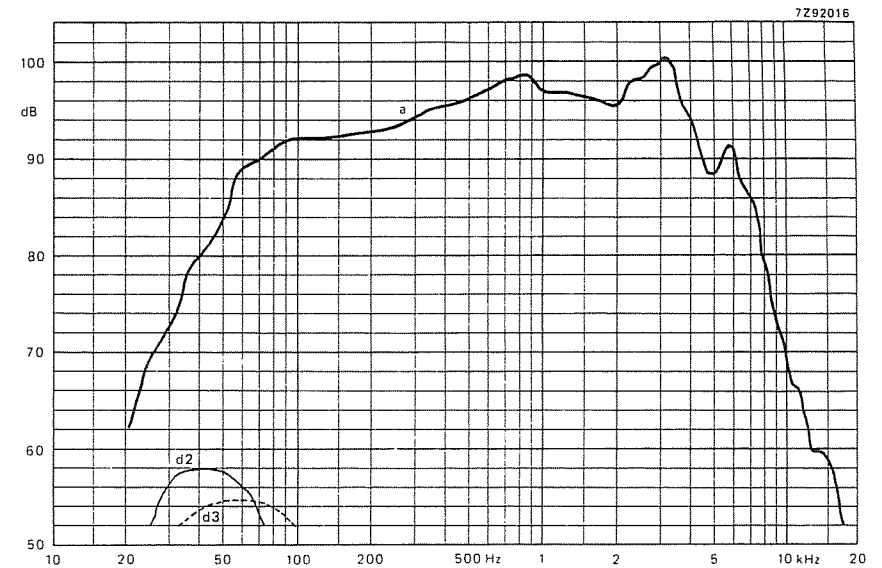


Fig. 2.

## 8 inch FLAT DIAPHRAGM WOOFER LOUDSPEAKER

## TECHNICAL DATA

	versions	
	W4	W8
Rated impedance	4	8 Ω
Voice coil resistance	3,6	6 Ω
Rated frequency range	20 to 2000 Hz	
Resonance frequency	48	47 Hz
Power handling capacity, loudspeaker unmounted	50	W
Max. power on loudspeaker	100	W
Operating power (sound level 96 dB, 1 m)	8	W
Sweep voltage (20 to 3500 Hz)	9	8 V
Filter	none	
Energy in air gap	210	249 mJ
Flux density	0,88	0,99 T
Force factor (B x l) at 1 A	5,4	6,1 Wb/m
Total moving mass, loudspeaker mounted	20	g
Compliance, loudspeaker unmounted	0,58	0,61 mm/N
Air-gap height	5	mm
Air-gap length	1,4	mm
Voice coil height	9	mm
Coil diameter	35	mm
Piston diameter	0,163	m
Piston area	0,021	m <sup>2</sup>
Magnet material	ceramic	
diameter	90	mm
mass	0,415	kg
Mass of loudspeaker	1,25	kg
Equivalent box volume	30,7	32,2 l
Recommended box volume	25	l
Rim material	rubber	

Connection is by 2,8 mm x 0,5 mm tag connectors by soldering.

Dimensions in mm

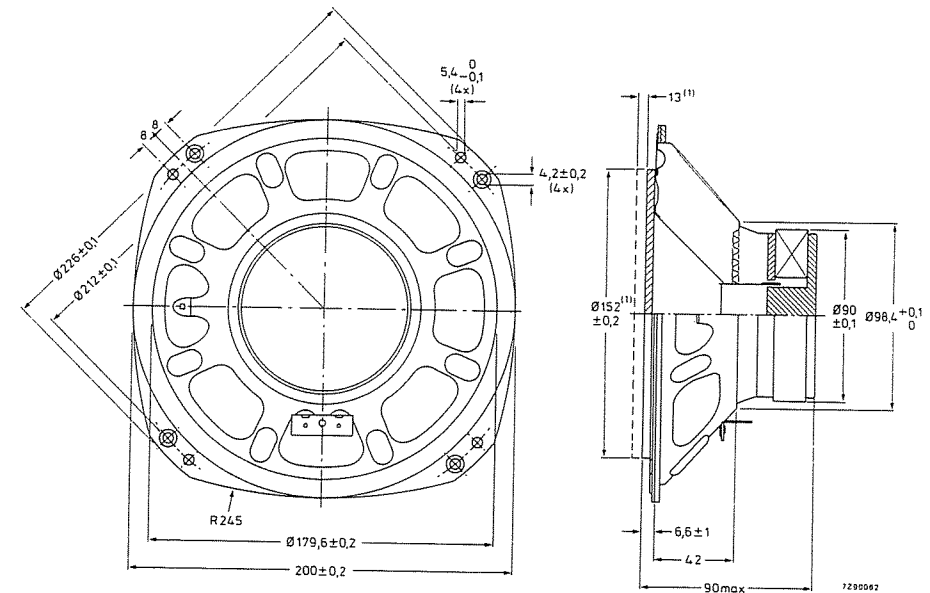


Fig. 1.

Recommended baffle opening ( $\phi$  152 mm) and mounting clearance (13 mm) are required for cone movement at the specified power handling capacity.

One tag has a red mark to facilitate phase matching.

## AVAILABLE VERSION

AD80681/W4 catalogue number 2422 257 50023 | These numbers are for bulk-packed loudspeakers.  
AD80681/W8 catalogue number 2422 257 50021 |

## FREQUENCY RESPONSE CURVES (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted in recommended box volume.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

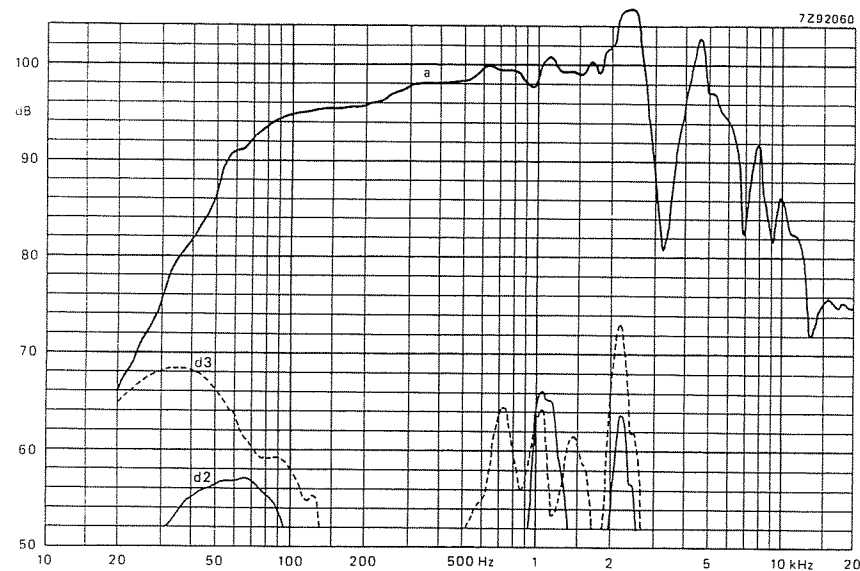


Fig. 2.

## 8 inch OCTAGONAL HIGH POWER LOUDSPEAKER

- frame: metal
- cone: paper
- surround: treated
- coil former: aluminium

## TECHNICAL DATA

	version		
	P4	M4	M8
Rated impedance	4	4	8 $\Omega$
Voice coil resistance	3,4	3,4	7 $\Omega$
Rated frequency range	55 to 6000	55 to 20 000 Hz	
Resonance frequency	75	85	Hz
Power handling capacity, measured without filter, loudspeaker unmounted	10	10	W
Maximum power on loudspeaker	20	27 W	
Operating power (sound level 90 dB, 1 m)	0,81	0,75	0,65 W
Sweep voltage (50 to 20 000 Hz)	4,5	5,5	7,75 V
Characteristic sensitivity	91	dB/W/m	
Energy in air gap	52	53	mJ
Flux density	0,68	0,98	T
Air-gap height	3	3	mm
Voice coil height	6,5	3,9	4,5 mm
Core diameter	18	18	mm
Magnet material	ceramic	ceramic	
diameter	53	53	mm
mass	0,1	0,1	kg
Mass of loudspeaker	0,37	0,36	kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.



Dimensions in mm

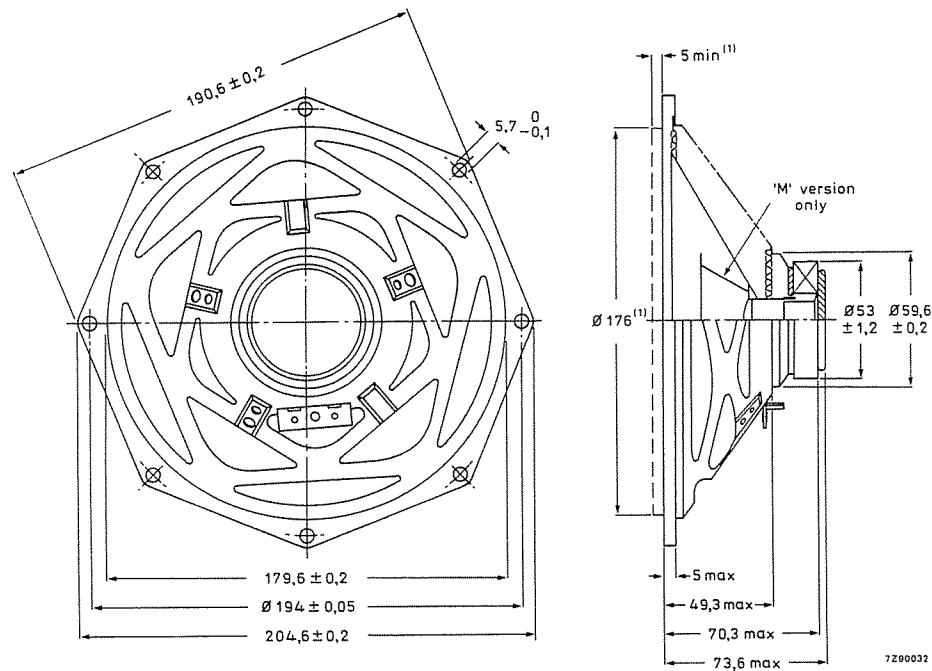


Fig. 1.

(1) Recommended baffle opening ( $\varnothing 176$  mm) and clearance depth (5 mm) are required for cone movement at the specified power handling capacity. One tag has a red mark to facilitate phase matching.

**AVAILABLE VERSIONS**

AD80800/M4	catalogue number 2422 257 38725	} These numbers are for bulk-packed loudspeakers.
AD80800/M8	catalogue number 2422 257 38726	
AD80800/P4	catalogue number 2422 257 38735	

**FREQUENCY RESPONSE CURVES** (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.

Curve a: Sound pressure.

Curves d2 and d3: 2nd and 3rd harmonic distortion.

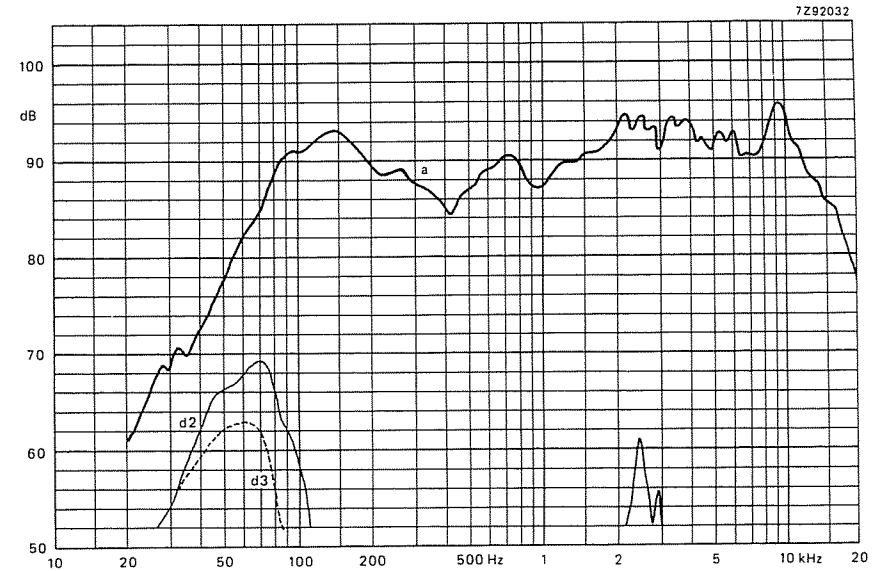


Fig. 2a AD80800/M.

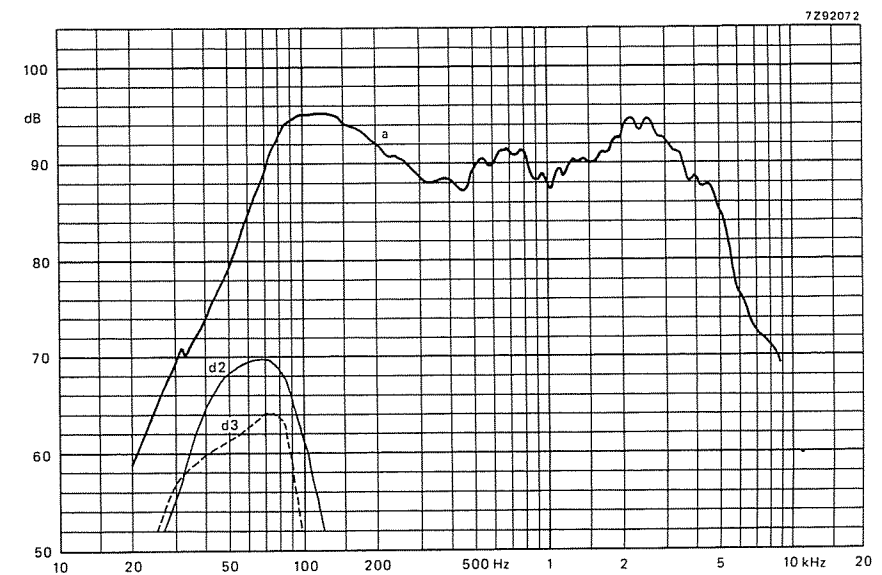


Fig. 2b AD80800/P.

## 8 inch WOOFER LOUDSPEAKER

- frame: steel, zinc plated, yellow
- cone: paper, black
- surround: textile

## TECHNICAL DATA

Rated impedance	4 $\Omega$
Voice coil resistance	3,4 $\Omega$
Rated frequency range	up to 5000 Hz
Resonance frequency	52 Hz
Power handling capacity, measured without filter, loudspeaker unmounted; 1 min. on/ 2 min. off, 300 h	25 W
Max. power on loudspeaker	50 W
Operating power (sound level 96 dB, 1 m)	5 W
Sweep voltage (20 to 5000 Hz)	3,9 V
Filter	none
Characteristic sensitivity	89 dB
Energy in air gap	140 mJ
Flux density	0,52 T
Force factor (Bxl) at 1 A	3,35 Wb/m
Piston diameter	m
Piston area	200 cm <sup>2</sup>
Total moving mass	10,6 g
Compliance, loudspeaker unmounted	0,991 x 10 <sup>-3</sup> m/N
Equivalent box volume	47,57 l
Quality factor, loudspeaker unmounted	
mechanical	5,4
electrical	0,97
total	0,82
Air-gap height	3 mm
Air-gap length	1,525 mm
Voice coil height	6,5 mm
Rated coil diameter	18 mm
Magnet material	ceramic
diameter	53 mm
mass	0,150 kg
Mass of loudspeaker	0,4 kg

Connection is by 2,8 mm x 0,5 mm tag connectors or by soldering.

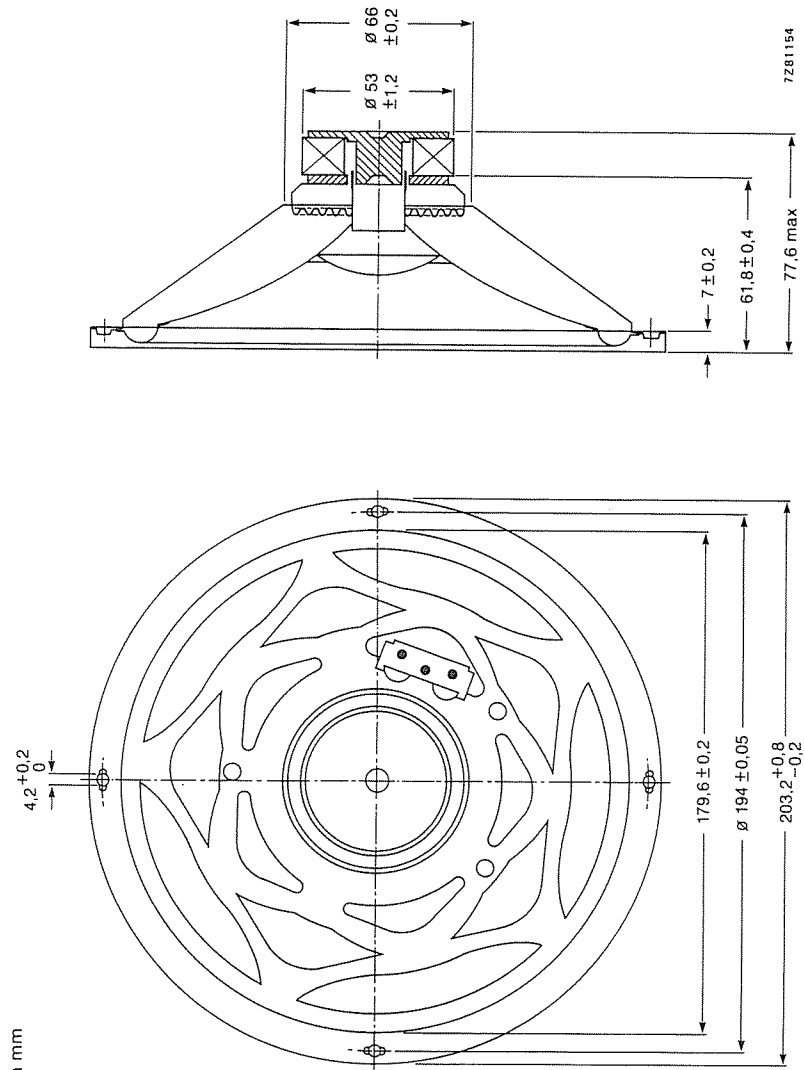


Fig. 1.

Recommended baffle opening ( $\phi$  182 mm) and mounting clearance (5 mm) are required for cone movement at the specified power handling capacity. One tag has a mark to facilitate phase matching.

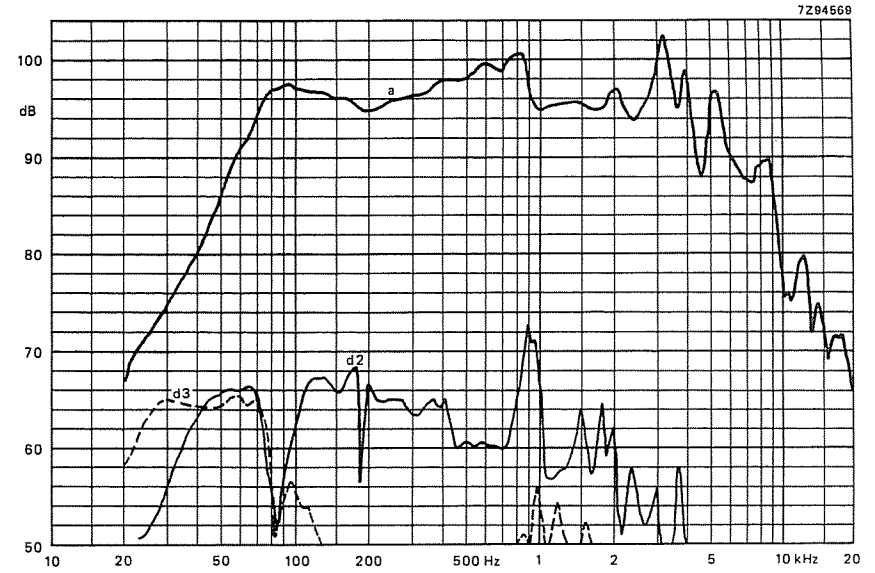


Fig. 2.

**AVAILABLE VERSION**

AD80800/W4 catalogue number 2422 257 38825 This number is for bulk-packed loudspeakers.

**FREQUENCY RESPONSE CURVES** (see Fig. 2)

Measured in anechoic room at the operating power. Loudspeaker front mounted on IEC baffle.  
 Curve a: Sound pressure  
 Curves d2 and d3: 2nd and 3rd harmonic distortion.

Dimensions in mm

## 8½ inch HIGH POWER FULL RANGE LOUDSPEAKER

## APPLICATION

A full range loudspeaker for studio monitoring equipment and domestic bass reflex enclosures for high fidelity reproduction from 45 Hz to 19 kHz.

## TECHNICAL DATA

Rated impedance	8 Ω
Voice coil resistance	6,4 Ω
Frequency range	45 to 19 000 Hz
Resonance frequency	50 Hz
Power handling capacity measured without filter loudspeaker mounted in sealed enclosure < 30 l	20 W
loudspeaker mounted in sealed enclosure > 30 l	10 W
Operating power	1,3 W
Sweep voltage, frequency range: 35 to 20 000 Hz	6,3 V
Energy in air gap	203 mJ
Flux density	0,9 T
Air-gap height	6 mm
Voice coil height	8,9 mm
Core diameter	34 mm
Magnet material	ceramic
→ diameter	90 mm
mass	0,4 kg
Mass of loudspeaker	1,32 kg

The loudspeaker has a paper dual cone and surround and a cork gasket on the flange.

Connection to the loudspeaker by means of 2,8 mm (0,11 inch) tag connectors or by soldering.

Dimensions in mm

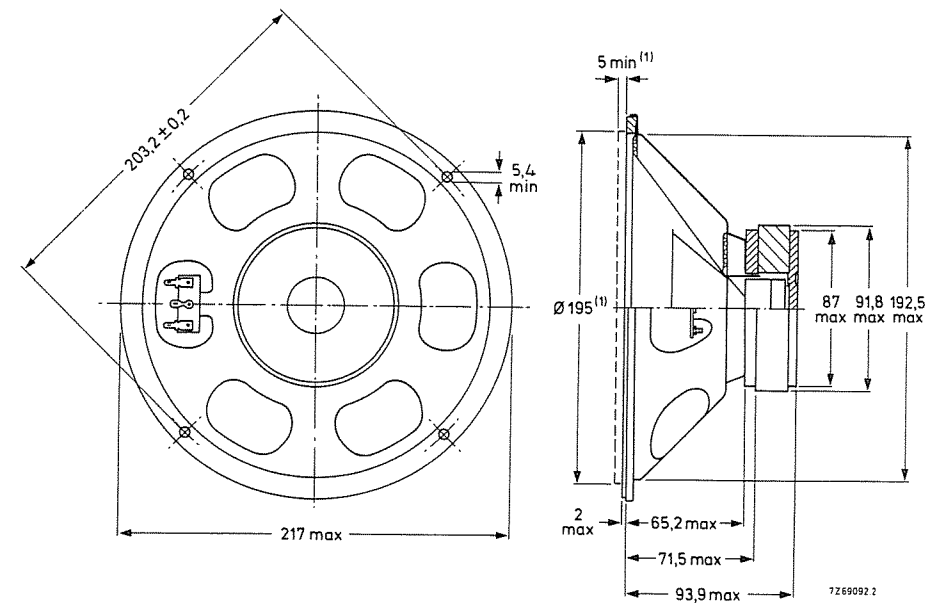


Fig. 1.

(1) Baffle hole and clearance depth required for cone movement at the specified power handling capacity.

One tag is indicated by a red mark for in-phase connection.

## AVAILABLE VERSION

9710/M8, catalogue number 2422 257 48121

this number applies to bulk packed loudspeakers, minimum packing quantity 8 per unit.

## FREQUENCY RESPONSE CURVES (see Fig. 2)

Curve a: Sound pressure measured in anechoic room, loudspeaker mounted on IEC baffle.

Curves d2 and d3: 2nd and 3rd harmonic distortion, measured at the operating power of 1,3 W in anechoic room, loudspeaker mounted in sealed 80 l enclosure, filled with 1 kg of glass wool.

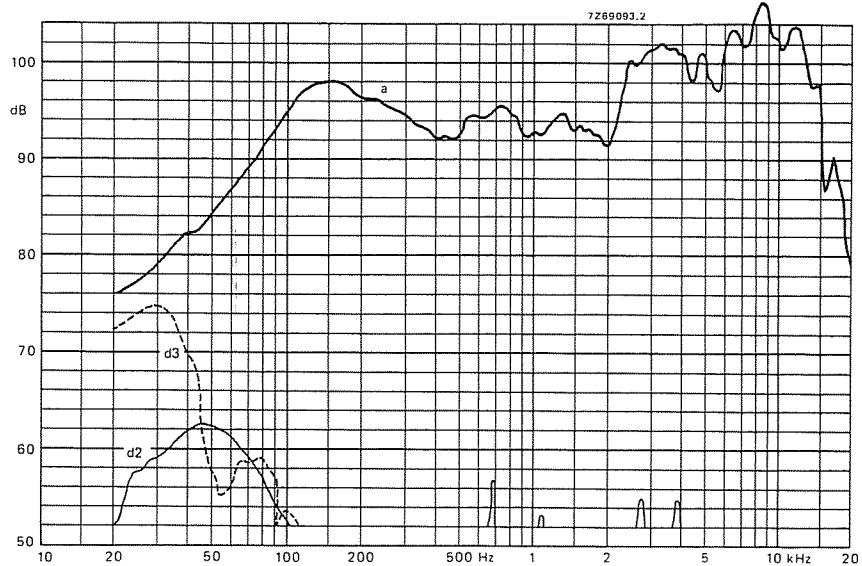


Fig. 2.